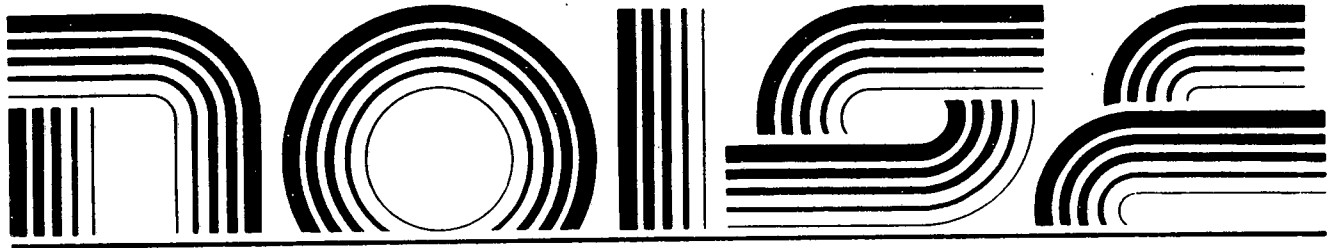
HIGHWAY



A REPRINT OF

THE AUDIBLE LANDSCAPE: A MANUAL FOR HIGHWAY NOISE AND LAND USE

Prepared for

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration
Office of Research and Development

Contents

tronic devices.

4.4 Barriers

A noise barrier is an obstacle placed between a noise source and a receiver which interrupts the path of the noise. They can be made out of many different substances:

a) sloping mounds of earth, called berms
b) walls and fences made of various materials including concrete, wood, metal, plastic, and stucco
c) regions of dense plantings of shrubs and trees
d) combinations of the above techniques

The choice of a particular alternative depends upon considerations of space, cost, safety and aesthetics, as well as the desired level of sound reduction. The effectiveness of the barrier is dependent on the mass and height of the barrier, and its distance from the noise source and the receiver. To be effective a barrier must block the "line of sight" between the highest point of a noise source, such as a truck's exhaust stack, and the highest part of the receiver. This is illustrated in Figure 4.16.

To be most effective, a barrier must be long and continuous to prevent sounds from passing around the ends. It must also be solid, with few, if any, holes, cracks or openings. It must also be strong and flexible enough to withstand wind pressure.

Safety is another important consideration in barrier construction. These may include such requirements as slope, the distance from the roadway, the use of a guard rail, and discontinuation of barriers at intersections.

Aesthetic design is also important. A barrier constructed without regard for aesthetic considerations could easily be an eyesore. A well designed berm or fence can aesthetically improve an area from viewpoints of both the motorist and the users of nearby land.

A) **Earth Berms** An earth berm, a long mound of earth running parallel to the highway, is one of the most frequently used barriers. Figure 4.17 shows a cross-section of a berm.

Berms can range from five to fifty feet in height. The higher the berm, the more land is required for its construction. Because of the amount of land required, a berm is not always the most practical solution to highway noise. Different techniques must be applied in urban as distinct from rural settings.

A berm can provide noise attenuation of up to 15 dBA if it is several feet higher than the "line of sight" between the noise source and the receiver. This is comparable to the noise reduction of various walls and fences which are used as barriers. However, earth berms possess an added advantage: instead of reflecting noise from one side of the highway to another, as walls do,[1] and thus increasing the noise heard on the opposite side, they deflect sound upwards. Figure 4.18 illustrates this phenomenon.

The cost of building a berm varies with the area of the country and the nature of the project. In California, the state-wide average for building a berm is about $1 per cubic yard when the earth is at the site.[2]

In planning a berm, one must include seeding and planting in figuring cost. Also to be included are land costs and maintenance in relation to erosion, drainage, snowplowing, mowing, and perhaps future seeding. It costs approximately $1,000 per acre per year to maintain a berm which is accessible to maintenance equipment.[3]

B) **Walls and Fences as Barriers** In addition to the more usual function of keeping people, animals and vehicles from entering the highway right of way at undesired locations, a properly designed fence or wall can also provide visual and acoustical separation between highway noise sources and adjacent land areas. This method can reduce noise as much as 15 dBA.[4]

The vertical construction and minimal width of walls and fences makes installation possible when space is severely limited. This is especially important when land costs are high, and where buildings are already adjacent to the highway. The advantages and disadvantages of wall and fence barriers are summarized in Figure 4.19.

The number of design variations for fence and wall barriers is virtually unlimited.

Acoustically, any solid continuous structure will suffice, provided that it is high enough, and provided that the barrier is of adequate mass and density.

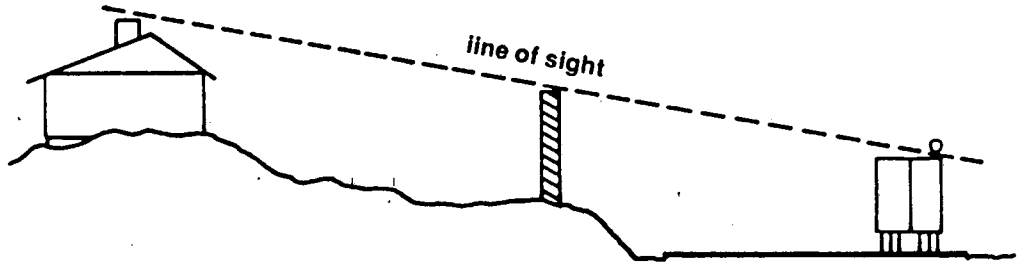
The cost of a fence or wall type barrier can vary considerably according to the type of construction, the material used, local availability of materials and skills, and the barrier's dimensions. Not all

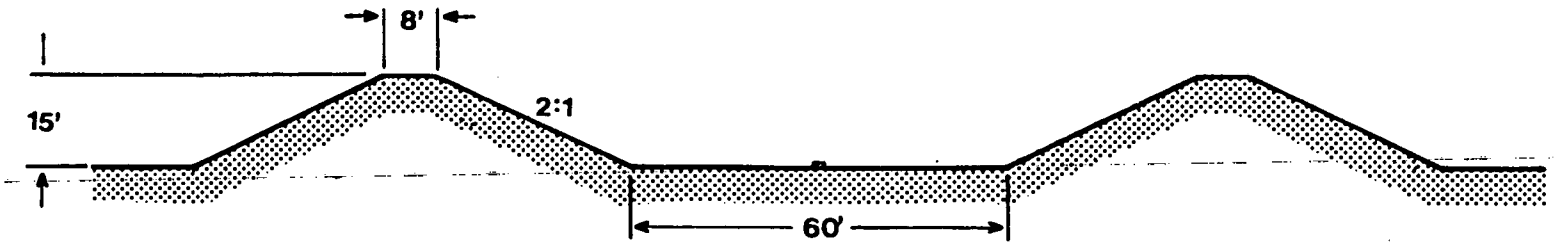
[1] Reflection of noise from one side of the highway to another can increase sound levels by 3 dBA. Scholes, Salvidge, and Sargent, "Barriers and Traffic Noise Peaks," *Applied Acoustics*, 5:3 (July 1972) p. 217.

[2] This estimate was provided by the California Highway Department.

[3] *Ibid.*

[4] California Division of Highways, *Highway Noise Control, A Value Engineering Study*, (October 1972).





4.16 To be effective, a barrier must block the "line of sight" between the highest point of a noise source and the highest part of a receiver.

4.17 Cross section of a berm

types of barriers are suited for all climates, and local conditions may cause significant differences in the maintenance cost of the various barrier types. The cost questions must be evaluated on a local basis.

Some of the frequently used materials for fence and wall construction are masonry, precast concrete, and wood.

Masonry noise barriers can be made of concrete blocks, brick or stone. A concrete block barrier might range in cost from $10 a linear foot for a 6-ft. high wall, to $75 a linear foot for a 12-ft. high wall. This latter figure includes a safety railing. In general, a concrete block wall would cost $50 to $60 a linear foot.[1] To alleviate the monotony of a long run of wall, pilasters can be used: a 20 ft. high concrete wall with pilasters might cost $300 per linear foot.[2] Brick and stone are extremely expensive and should only be used for special aesthetic considerations.[3]

Precast concrete panels offer opportunities for cost reduction. A 13' 4" high wall in Fairfield, California constructed of pre-cast concrete panels cost only $29.50 per linear foot.

Wood noise barriers are another possibility. They tend to be less expensive than other methods but are not as durable. An estimated cost for a 6' high 5/8" plywood fence is $5.00 per linear foot.[4]

C) **Plantings** Plants absorb and scatter sound waves. However, the effectiveness of trees, shrubs, and other plantings as noise reducers is the subject of some debate. Some conclusions can, however, be drawn:

- Plantings in a buffer strip, high, dense, and thick enough to be visually opaque, will provide more attenuation than that provided by the mere distance which the buffer strip represents. A reduction of 3-5 dBA per 100 feet can be expected. Shubs or other ground cover are necessary in this respect to provide the required density near the ground.
- The principal effect of plantings is psychological. By removing the noise source from view, plantings can reduce human annoyance to noise. The fact that people cannot see the highway can reduce their awareness of it, even though the noise remains.
- Time must be allowed for trees and shrubs to attain their desired height.
- Because they lose their leaves, deciduous trees do not provide year-round noise protection.

In general, plantings by themselves do not provide much sound attenuation. It is more effective, therefore, to use plantings in conjunction with other noise reduction techniques and for aesthetic enhancement.

The cost of plantings varies with the species selected, the section of the country, the climate, and the width of the buffer strip. For deciduous trees and evergreens, costs range from $10 to $50 a linear foot. The width of such a strip would be approximately 40 feet for deciduous trees and 20 feet for evergreens. Planting shrubs between the trees so as to form a dense ground cover would double the price.

D) **Combinations of Various Barrier Designs** Often, the most economical, acoustically acceptable, and aesthetically pleasing barrier is some combination of the barrier types previously discussed.

For example, the Milwaukee County Expressway and Transportation Commission feels that barriers constructed of pre-cast concrete on top of an earth berm provide maximum benefit for the cost.[5] They estimate that such a combination costs $51 per linear foot.

In addition to cost advantages, an earth berm with a barrier wall on top of it possesses several other advantages over both a wall or a berm alone: 1) it is more visually pleasing than a wall of equivalent height; 2) the berm portion of this combination is less dangerous for a motorist leaving the roadway; 3) the non-vertical construction of the berm does not reflect noise back to the opposite side of the highway the way a wall does; 4) the combination requires less land than would be required for a berm of equivalent height and slope; and 5) the wall provides a fencing function not provided by a berm.

Another combination to be considered is that of plantings in combination with a barrier. Not only do plantings and ground cover provide some additional noise attenuation, but they also increase visual appeal.

4.5 Conclusion

Figure 4.19 provides a summary of the physical techniques which can be used by designers, builders, and developers to reduce highway noise impacts. Some

[1] Figure provided by an official of the California Highway Department.

[2] Representative cost estimates of materials and labor of construction but excluding real estate acquisition; private

[3] California Division of Highways, *Highway Noise Control, Value Engineering Study*, (October 1972), p. 33.

[4] California Division of Highways, *Highway Noise Control, Value Engineering Study*, (October 1972) p. 46.

[5] Milwaukee County Expressway and Transportation Commission, *Noise Impact Study of the Airport Spur*, V. II: *Technical Report*, (March 1973), pp. 7-21.

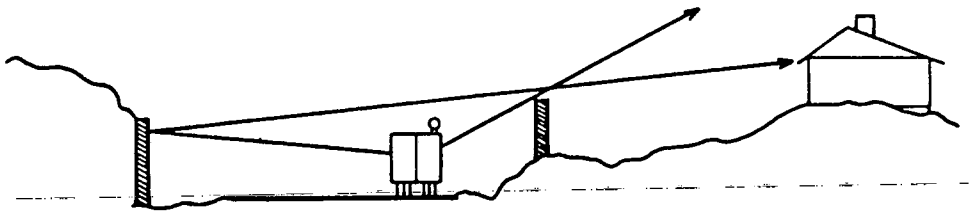
conclusions follow which may be useful in getting them impiemented.

As is indicated by the chart below, five factors which must be considered in the selection of noise reduction measures include the following:

1) Noise reduction desired
2) Situation where the physical technique would be most effective
3) Cost
4) Relevant administrative techniques
5) Aesthetics

Noise Reduction The physical techniques discussed vary in their noise reduction capabilities. For example, the effectiveness of the less expensive techniques, such as site planning and acoustical architectural design, is limited to situations where there is some distance between the buildings and the noise source. If the noise source is nearby and significant noise reduction is desired regardless of the expense, then more expensive measures, such as acoustical soundproofing and barrier construction, may be necessary.

Situation where a technique is most applicable The applicability of a technique is determined by the population density of an area and the point in the development process at which the technique is to be used, i.e., its timing. In a densely populated area, site planning (perhaps in conjunction with construction of a berm and a region of plantings) can often solve the noise problem. In a high density area where land is scarce and expensive, a better alternative would be barrier construction and acoustical soundproofing of the buildings.



4.18 Wall barriers may reflect sound from one side of the highway to the other.

Physical Technique	Potential Effectiveness	Situations Where Most Effective
Acoustical Site Planning	Good-excellent: depends on size of lot and natural terrain	Before building construction, before subdivision development
Acoustical Architectural Design	Fair	Before building construction
Acoustical Construction	Excellent for interior, poor for exterior	During building construction best. More costly after construction
Barriers	Fair-excellent, depends on height and mass	Varies with type of barrier
Earth Berms	Good-excellent	Best during road construction when earth is available. Costly after road construction. Impractical in densely populated areas where land is scarce.
Walls and Fences	Poor-excellent, depends on height and mass	Any time
Plantings	Poor	After road construction After building construction
Combinations	Good-excellent	Depends on particular combination

4.19 Summary of Physical Techniques to Reduce Noise Impacts

Cost	Relevant Administrative Technique	Comments
Low, only costs are fees of acoustical consultant and site planner	Zoning, subdivision rules, building code	Fairly inexpensive but requires space which mey be unavailebie. Has limited sound reduction. Positive aesthetic impacts.
Low: only cost is that of ecoustical consultant	Building code* Health code	Low cost but limited effectiveness
Varies with amount of noise reduction desired but generelly high, especially after construction	Building code* Health code	Most effective noise reduction for interiors, but very costly. Note that exterior noise levels are not reduced. Individual components (acoustical walls, windows, ceilings, doors) must be used together to be effective.
Moderate-high: varies with type of barrier, see below.	Zoning, subdivision rules, health code	High noise reduction and potentially low cost. Achieves exterior noise reduction. Can have adverse aesthetic impacts.
Moderate-high: depends on availability of earth		Good noise reduction properties and aesthetic appeal, but requires space and requires maintenance
Low-high: depends on height and thickness		Requires little space and no maintenance, but mey be aesthetically unappealing and can reflect noise to other side of road.
Moderete-high: depends on size of buffer strip		Poor noise reduction but often necessery for aesthetic eppeel. Best used in combinetion with other techniques
Moderate-high: depends on type barriers used.		Potentially high noise reduction and aesthetic eppeal.

*Administrative techniques which can achieve any physical technique are health codes, occupany permit procedures, architectural review boards, and municipel design services.

The timing of a technique aiso determines whether or not it is appiicabie. There are three points at which physicai noise reduction measures can be used: in the pianning phase; during building construction; and after construction. Techniques applicabie during the pianning phase inciude acoustical site planning and acoustical architecturai design. During the construction phase, those techniques most applicabie for highways are berms and barriers, since building materials are available at the site; and during building construction the most appropriate measure is acousticai soundproofing. it is possibie to undertake noise reduction measures after construction, but costs are much higher.

Cost Cost is a very important consideration in the selection of a physical noise reduction technique. Generaiiy, cost is determined by the amount of noise reduction desired and whether the noise measure is a preventative or ameliorative one.

The most effective noise reduction measures are often the most expensive. These Inciude barrier construction and acoustical soundproofing. However, If action is taken as a preventative measure in the pianning stage, there is often no need for the more expensive techniques.

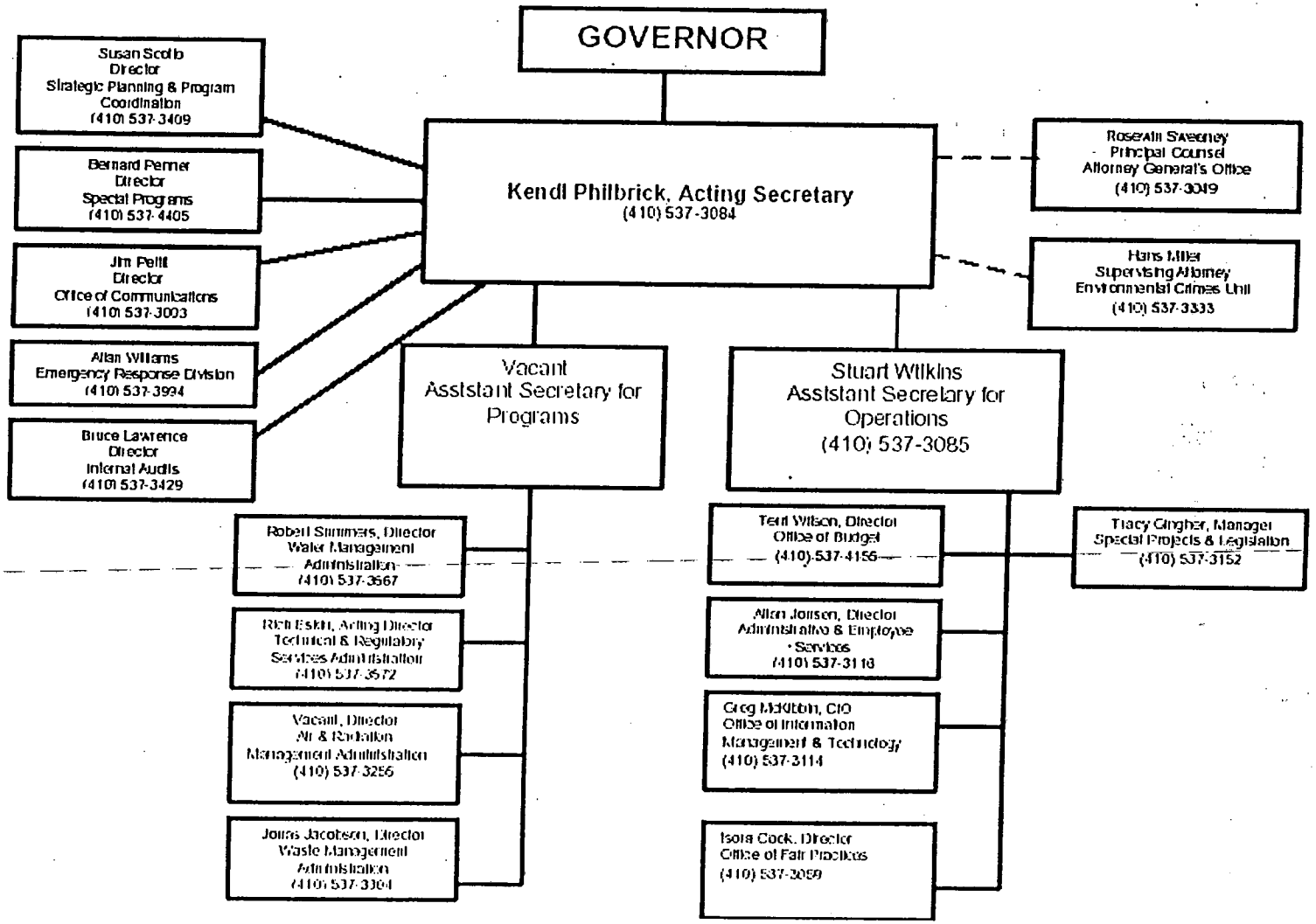
Relevant administrative techniques Aii these physical techniques depend upon administrative actions for implementation. It is possibie that physicai measures to reduce noise would be taken without iocai government action, but since they invoive extra expense, it is unlikeiy that they would be adopted on any significant scaie. Many administrative means exist to achieve each physical noise reduction technique. For example, a noise impacted area can be zoned to specify detaiis of development design or construction. in such an area, buffer strips (acoustical site pianning), acoustical arrangement of living spaces (acoustical architecturai design), building insulation (acoustical construction techniques), and barrier construction could be required. Similar requirements could be included in the subdivision laws. Building and health codes, enforced by withholding an occupancy permit, are effective ways to bring about acoustical soundproofing. As expiained in the section on Buiiding Codes, particular acoustical construction materiais can be required or specific performance standards established.

Aesthetics Aesthetic and quality of iife considerations are another important area of concern. They depend iargeiy on iocai preferences and climate, and opinions of what is aesthetically pieasing will vary among communities.

Whatever the aesthetic judgement, aesthetic considerations must be incorporated into the planning and construction process to insure that the solution which results is not offensive to the community. This can save a great deal of time and money in the long run.

Finaiiy, it should be stressed that no single technique or combination of techniques is best for aii situations, and that technique which is best wiii depend on the nature of the project. The factors which are discussed above (i.e., noise reduction, cost, appiicabiiity, and aesthetics) must be baianced against each other to determine which technique or combination of techniques wiii be most effective in a given situation.

MARYLAND DEPARTMENT OF THE ENVIRONMENT



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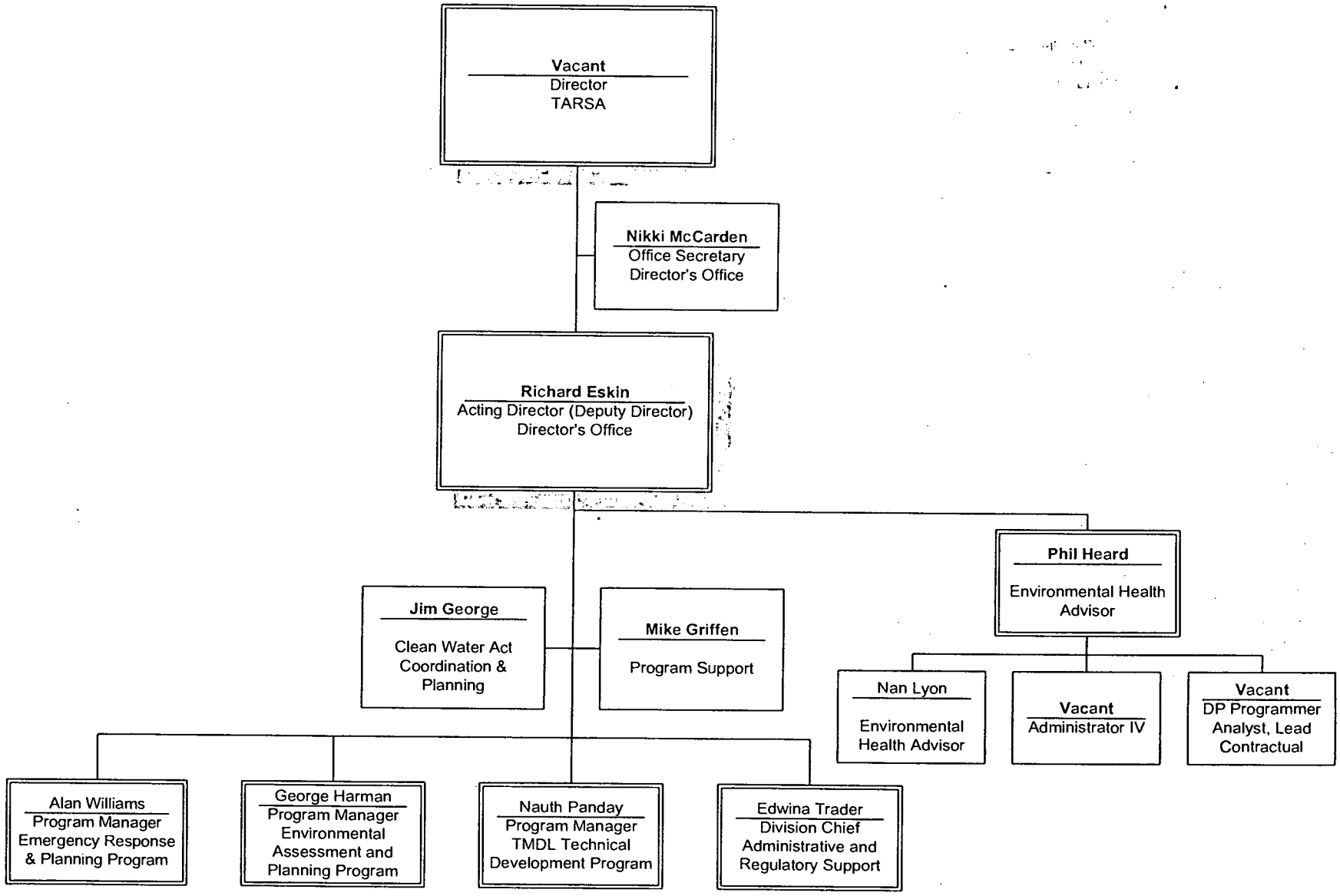

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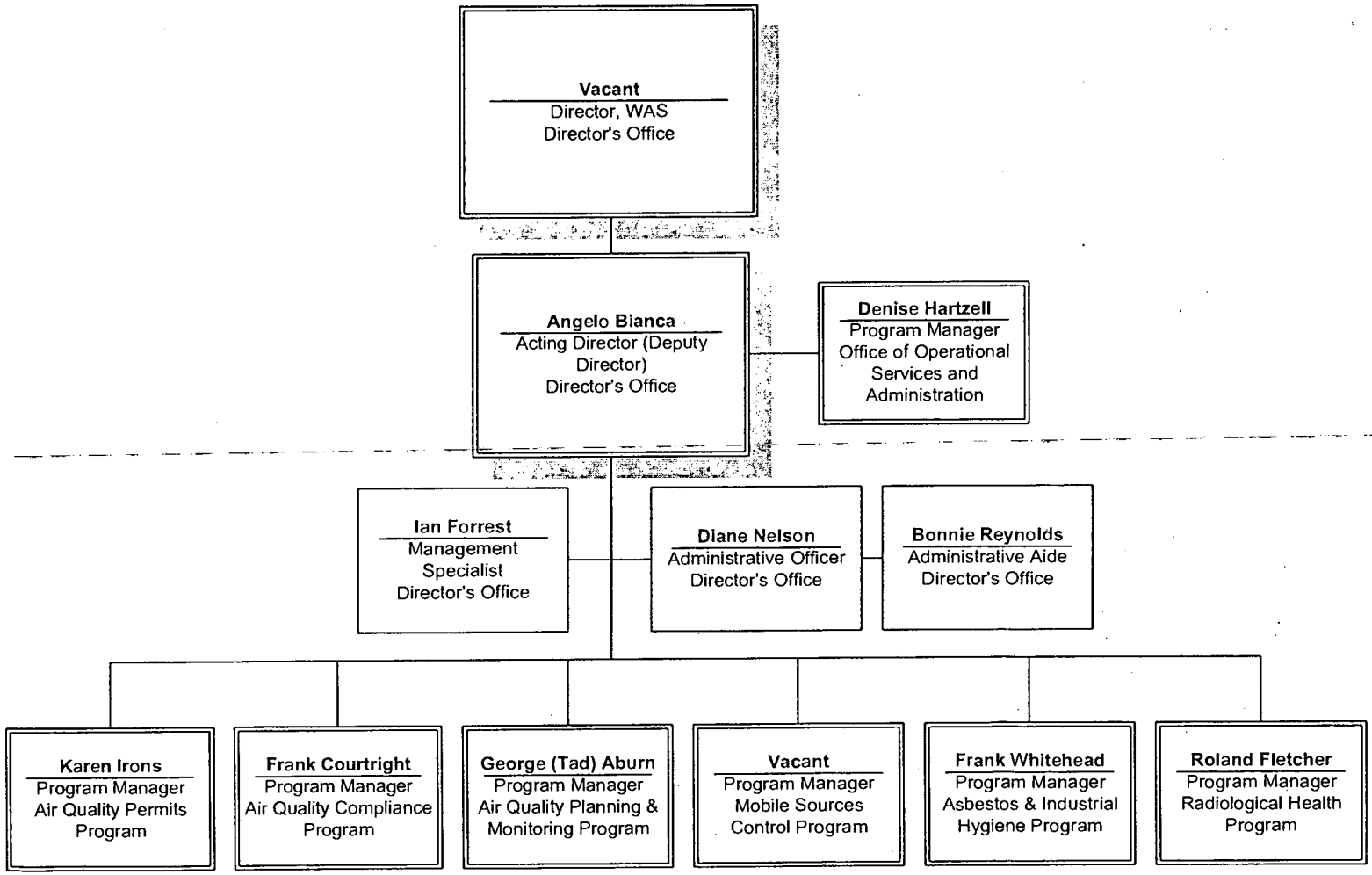

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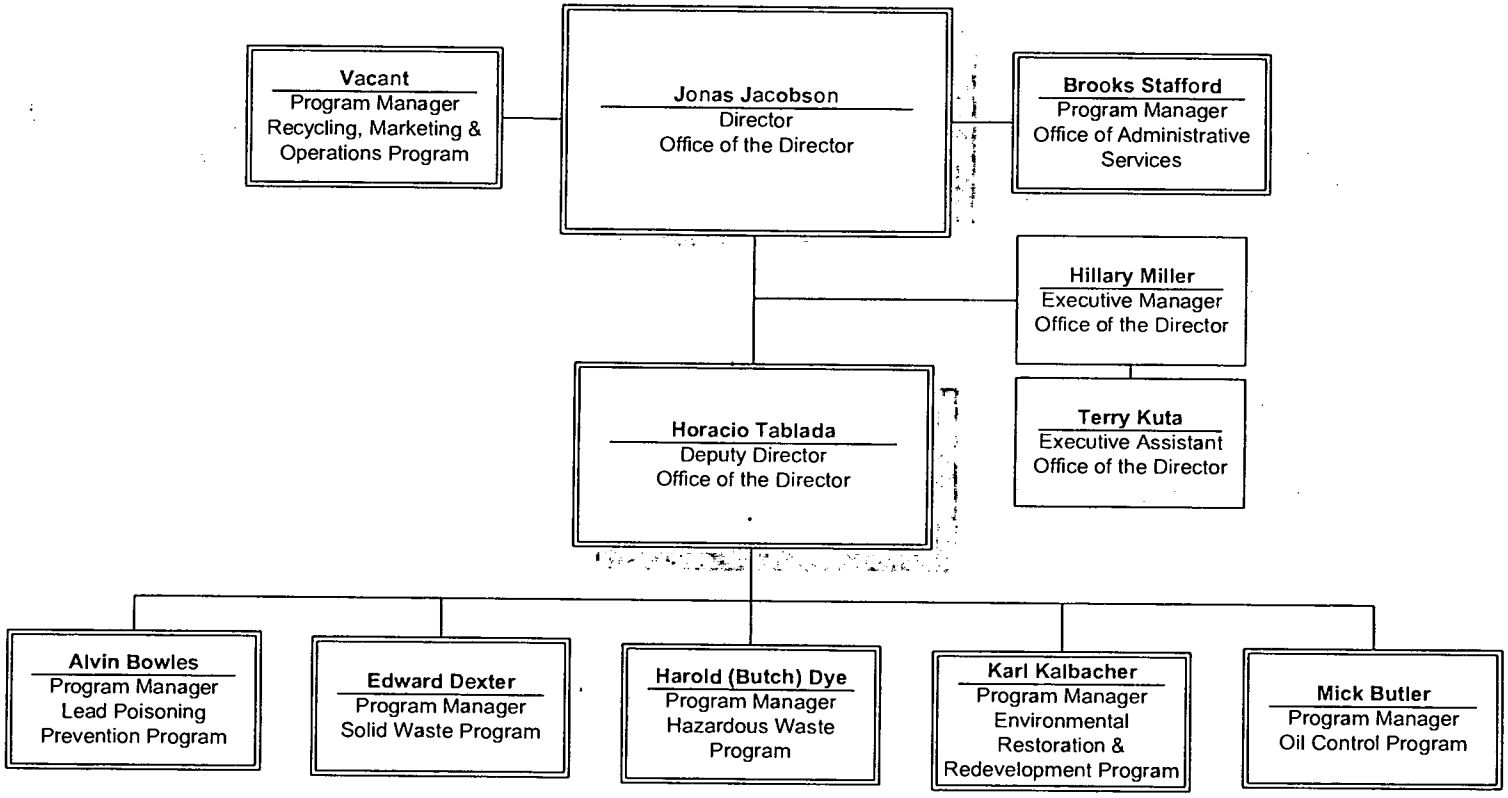

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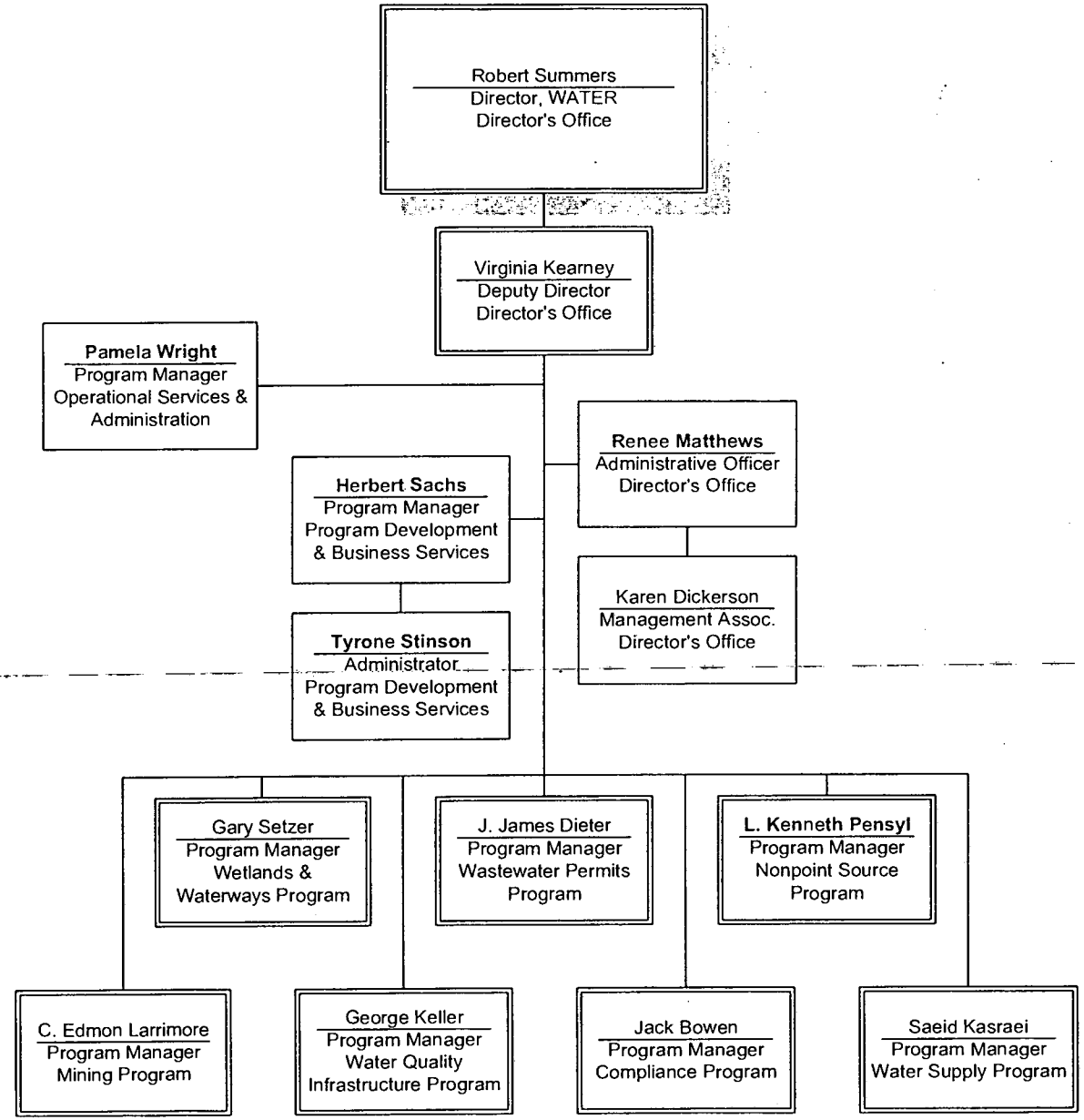
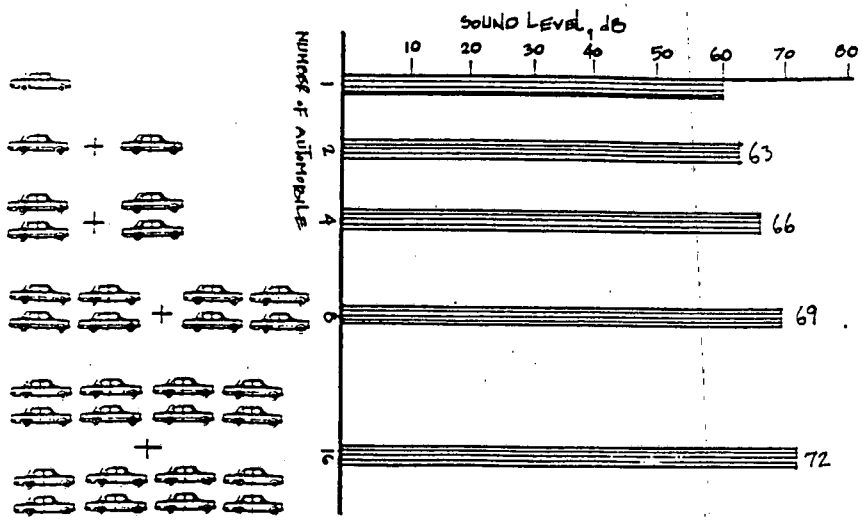


FACT SHEET

THE EFFECTS OF TRAFFIC VOLUME CHANGES ON NOISE LEVELS

The intensity of noise generated from highway traffic is related to several major factors including distance of the receptor from the highway, the number or volume of vehicles and their travel speed, and the mix of vehicle types (that is, number of trucks versus autos, etc.). This discussion focuses on the overall volume of highway traffic and how changes in the number of vehicles affect the overall noise level generated from the highway.

In general, it can be correctly stated that an increase in traffic volume will cause increased noise. However, the amount of increase in noise will depend on the relative increase in traffic volume, as illustrated below:



It is generally accepted that the average person can just begin to perceive a change in noise level of about 3 decibels (dBA). This 3 dBA change represents a doubling of the total noise "energy". In each instance, the adjacent illustration shows that for an increase of 3 dBA in the overall noise level to occur, the number of vehicles must be **doubled** (that is, increased by 100%), and that this doubling must occur regardless of the actual volume of traffic. For example, if a highway carrying 5,000 vehicles per hour produces an overall noise level of 80 dBA, the traffic volume must incraase to 10,000 vehicles per hour for the overall noise level to increase by 3 to 83 dBA. **The conclusion is that as the total number of vehicles on a roadway increases, it requires more and more additional vehicles to cause a noticeable change in the overall noise level.**

In reality, on highways such as freeways, interstates, or other controlled-access roadways, traffic volumes are so high that relative changes in vehicle volume over time are typically well below the doubling or 100% change that would be necessary to affect a 3 dBA change in the noise level. The incremental addition of 100, 200, or even 1000 vehicles per hour to the example highway with 5,000 vehicles per hour is not sufficient to contribute enough additional energy to effect the overall noise level by a perceptible amount. This, of course assumes that the vehicles individually would produce similar noise levels (as in the illustration), and does not address changes in the mix of vehicle types, such as the number of large, heavy-duty trucks versus autos, for example.

This condition is often manifested in the results of noise impact studies for projects to widen existing highways, especially those with already substantial traffic volumes. For projects which widen within an existing median (that is, do not place traffic closer to adjacent receptors or properties), only the incremental growth in traffic over time contributes to increased noise levels. The ultimate growth in traffic will ba somewhat constrained by tha capacity of the highway, as will the resulting noise level.

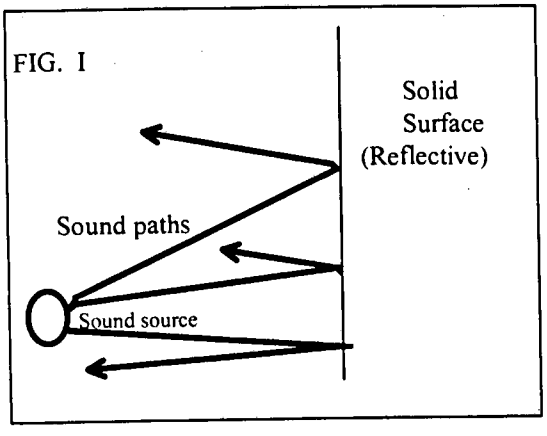
Even if a highway is widened to the outside of the existing roadway, the increased capacity of the new expanded roadway and expected growth in traffic volume over time will still only account for a fraction of the total traffic on the highway. In this example, the addition of a small fraction of the total traffic slightly closer to adjacent properties would contribute to the total noise level, but still represents only a fraction of the total noise emanating from the highway. For example, if a 6-lane highway is widened by one lane in each direction to a total of 8 lanes, one-eighth of the total traffic would be placed approximately 12 feet closer to the adjacent property (the typical width of one highway lane). In such cases, the resultant increase in noise is still typically well below the 3 dBA perception threshold. This would generally apply only if the distance shift is small relative to the overall distance between the existing highway and adjacent property, meaning, for example, that the noise increasa would be greater if the distance to the adjacent property were 25 feet, than if the distance were 100 feet.

Absorptive Versus Reflective Highway Noise Barriers

In the construction of highway noise barriers, the surface of the barriers may function in one of two ways; sound that strikes the barrier surface may be either reflected or absorbed. The following discussion is presented to explain the phenomena of sound reflection and absorption, and to explain the rationale and circumstances under which each barrier surface is most appropriate.

Sound is energy that decreases in intensity as it travels away from its point of origin. Sound waves propagate (travel) out in all directions from vehicles traveling on the roadways. When the sound waves encounter an obstacle such as a building, noise barrier, or other solid object , some of the sound waves will bounce off the obstacle's surface, if the surface is solid (see Figure I, below).

FIG. I



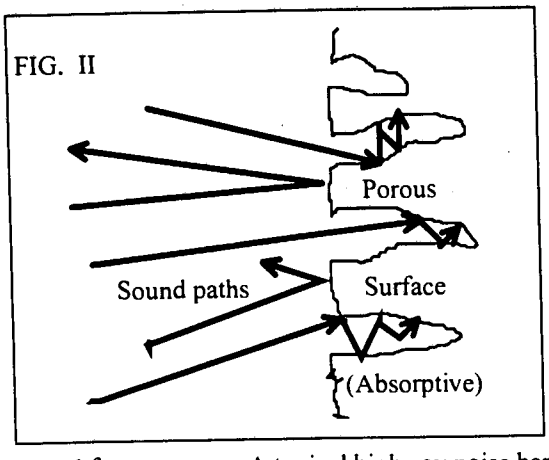
The laws of physics indicate that in the worst case, if 100 percent of the sound energy is reflected from the solid surface of the obstacle, the strength of the total noise source would double, **in the worst case only.** This concept of doubling the noise source strength and how sound is measured (on the decibel scale) is illustrated in the attached sheet entitled "Decibel Addition". It shows that a doubling of the noise source strength translates to a 3 decibel (dBA) increase in the sound level. A change in sound level of 3 dBA is barely perceptible to the average person, and is generally considered to be a negligible change.

In reality, distance effects and other factors that also affect sound propagation, make this theoretical 3 dBA increase impossible under most circumstances. Because the actual sound sources (vehicles on the highway) are always some distance from the noise barrier, the sound waves traveling to the barrier, reflecting off and returning will constantly be reducing in intensity, so the actual total source strength will never be truly doubled. The conclusion is that a single reflecting surface will not cause a perceptible increase in the overall noise level.

The obvious question then is, "why and when do highway noise barriers need to have absorptive surfaces?"

If the surface is porous , where there are small cavities or holes that extend into the interior of the barrier material (see Figure II, below), a portion of the sound waves when they reach the surface will travel inside the cavities, bounce around and eventually expend all of their energy. This process is called absorption. Increasing the number of cavities or holes in the surface of a noise barrier wall or other obstacle will ultimately result in more sound energy being absorbed. The size of the cavities in a surface will also affect how the sound waves will be absorbed.

FIG. II

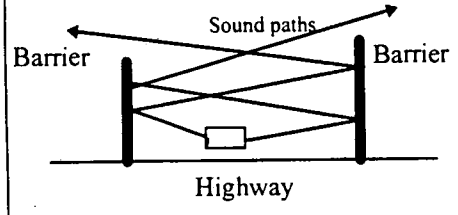


Sound is made up of many different waves of various lengths or sizes. These are called frequency bands and correspond to the pitch of the sound we hear. For example, high pitch or high frequency sounds such as a whistle , bird chirp, or rustling leaves have wave sizes in range of several inches. Low frequency sounds such as a rumbling truck engine, or distant jet aircraft have wave sizes in the range of several feet or more. A typical highway noise barrier (depending on the surface) will reflect or absorb higher frequency sound to a greater degree than low frequency sound, . This is because low frequency

sound waves are large in size relative to the barrier itself. Because highway traffic noise tends to have more high frequency sound waves, a typical absorptive noise barrier surface can be very effective.

The circumstances when absorptive noise barriers are most beneficial can be illustrated by the two generalized scenarios given in Figures III and IV. In both cases, reflected sound waves present the potential for adverse effects, although any particular situation will be unique and must be considered on a case-by-case basis.

FIG. III



Parallel Noise Barriers

Figure III (viewed looking down the highway parallel to traffic flow) illustrates a condition in which two noise barriers (both reflective) are located on either side of a highway and running parallel to each other and the highway. Vehicle noise generated between the two barriers bounces back and forth between the barriers (also called reverberation) and builds up to an extent that the noise reduction behind each barrier is degraded over what would occur with a "single barrier" case. In this situation, the resultant **multiple reflections** together could contribute to increasing the overall level beyond the 3 dBA maximum referred to earlier, while each individual reflection by itself would not.

FIG. IV

EFFECT OF BARRIER SHAPE ON REFLECTED NOISE

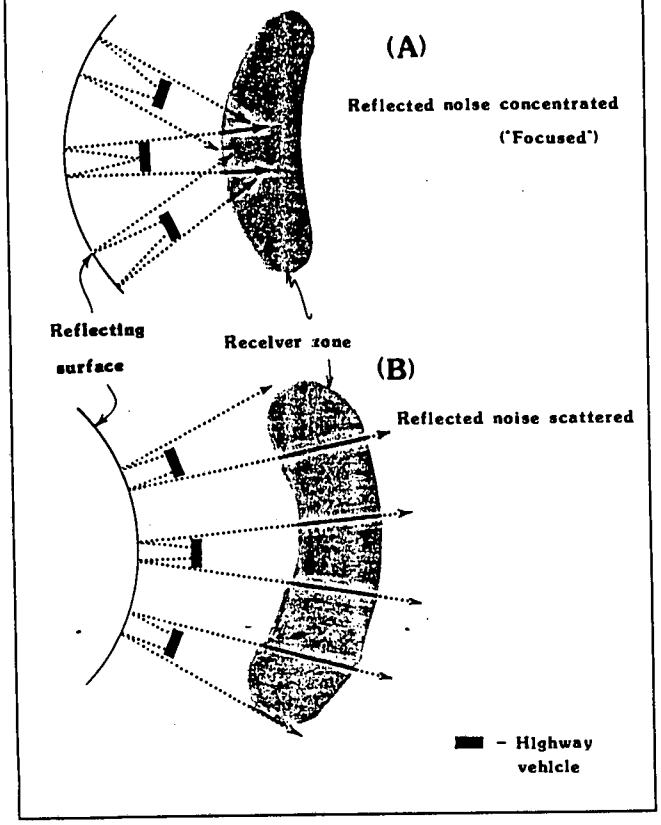


Figure IV presents a scenario which is less common, and somewhat less predictable in terms of overall effects. In this case, the shape of the noise barrier alignment may affect how reflected sound waves are directed. The illustration shows a line of vehicles (viewed looking down) with two different reflective barriers on the left and a receiver zone on the opposite side of the highway from the noise barrier. In scenario "A", the barrier alignment is concave, like a bowl or satellite dish. Each individual vehicle emits noise, a portion of which will be reflected off the barrier surface and back across the road to the receiver zone. As was the case in Figure III, each single reflection alone contributes little to the overall noise in the receiver zone, but together the reflected noise may be "focused" in a particular area, depending on the distances and alignment curvature of the barrier. Under scenario "B", such a focusing of the reflected sound waves would not occur, and the overall effect of the reflected noise would be negligible throughout the receiver zone.

It is important to note that the potential adverse effects of reflected sound will be unique in every situation. Distance and elevation relationships between the roadway, noise barriers , and adjacent receivers (residences, etc.) all will contribute to either increase or lessen the effects of reflected noise. In either of the situations illustrated in Figures III or IV, the best solution is to eliminate the potential for reflected noise influence through the use of an absorptive noise barrier.

FACT SHEET

BASIC ELEMENTS OF A HIGHWAY TRAFFIC NOISE ANALYSIS

Introduction

There are five basic elements of a highway traffic noise analysis. These are spelled out in the Federal regulations which govern the implementation of new highway construction or reconstruction of existing highways, and are listed as follows:

1. Identification of existing activities, developed, and undeveloped lands (for which development is planned, designed, and programmed) which may potentially be affected by noise generated by the completed highway project.
2. Determination of existing noise levels.
3. Prediction of future traffic noise levels expected from the proposed highway project.
4. Determination of the degree and extent of traffic noise impacts.
5. Examination and evaluation of alternatives for noise abatement to reduce or eliminate the identified noise impacts.

Identification of Existing Activities and Land Uses

As the first step of a highway traffic noise analysis, all existing land uses and future planned development in the vicinity of the proposed highway project must be identified. It is at these locations that existing noise levels are determined, and future noise levels are predicted, and the degree and extent of noise impact is determined. "Noise sensitive areas" (NSA's) are established along the proposed highway alignment and are usually representative of various communities, schools, churches, parks, or other land uses that are deemed to be "noise-sensitive".

Within each NSA, one or more "receptor sites" are selected to be representative of areas of "typical human use" on the subject property. For residential property, the area directly adjacent to the highway is typically chosen (the middle of a backyard, adjacent to a pool or patio, or any location where normal activities would take place). Extreme locations on a property (such as at the property line or right-of-way line) are usually avoided, because they are not areas of regular or frequent use, and may give a misleading representation of noise impact.

The number of receptor sites chosen for a given noise sensitive area must be sufficient to account for varying topographic features, highway geometry, or other conditions which could substantially affect the traffic noise level in different locations. Receptor sites are representative of locations where the "worst-case" existing noise levels are suspected, or where future noise is anticipated to be substantial as a result of the highway project.

Consideration of undeveloped lands or new developments along the proposed highway project is provided as prescribed in the Maryland State Highway Administration (MdSHA) Sound Barrier Policy, dated May 11, 1998.

Determination of Existing Noise Levels

In determining the existing noise in an area, it is important to identify the source of the noise; the ultimate goal is to establish a "baseline" for impact assessment. In assessing impact, the relationship of existing noise to future (predicted) noise levels, is a factor.

The noise level descriptor used for highway noise measurement and impact assessment is the A-weighted average or "equivalent" sound level (Leq), expressed in decibels (dBA). The Leq noise level is an "average" of the total acoustic energy measured in a given time period. When noise is measured with A-weighting, the instrument measures or "hears" the different high and low frequencies of the noise in the same way as the human ear. It places greater emphasis on high frequency sound (to which the human ear is most sensitive).

Highway noise measurement studies may be defined as either long-term or short-term. A long-term measurement typically involves continuous monitoring for a minimum of 24 hours. Short-term monitoring may involve time periods of as little as 5-10 minutes, or as long as one hour. In noise measurements along an existing highway, the duration of each measurement test is dependent largely upon the volume of traffic on the given highway. For rural highways with only occasional vehicle passbys, measurements may need to be as long as one hour to be statistically reliable. However, for high volume roadways such as freeways, major interstates, or other controlled-access highways, (with a more constant stream of traffic) measurements of 5-10 minutes duration will yield reliable results.

The time of day during which testing is conducted is dependent upon traffic conditions. The hour or hours which have the highest traffic volumes, and the highest travel speeds will yield the highest noise levels. The peak or rush-hour may not necessarily yield highest noise level, particularly if lower speeds or stop-and-go traffic conditions prevail.

Prediction of Future Noise Levels

Based on the proposed highway alignment, computer programs developed by the Federal Highway Administration (FHWA) are used to forecast the level of noise in the "design year", which is typically about 20 years into the future. The computer program uses traffic volumes, the percentage of trucks, and travel speeds to generate noise levels at the previously selected receptor sites. Noise levels are then calculated based on the distance of the receptors from the proposed highway. Physical features such as hills, valleys, or other "barriers" that would affect how the noise would travel to the receptors are also accounted for by the computer programs. The computer programs used are called STAMINA/OPTIMA.

Determination of Noise Impact

Noise impacts are realized when either of the following conditions are identified; 1) future noise levels are forecast to reach or exceed the impact threshold level of 66 dBA (Leq), or 2) the highway project will increase future noise levels by 10 dBA or more over existing measured levels.

Evaluation of Noise Abatement Alternatives

If noise impacts are anticipated, consideration must be given to noise abatement to minimize or eliminate impacts from the subject project. **This alone does not mean that abatement will be implemented.** All of the appropriate qualification criteria, as set forth in the MdSHA Sound Barrier Policy, must be met before abatement can be considered "reasonable and feasible".

Abatement may or may not be in the form of a sound barrier. The specific form of noise abatement is determined on a site-by-site basis, and can be influenced by the type of use or activity that is potentially impacted.

Interagency N.C. Comm. 12/15/03 20

Public Hearing - may be during Council/Comm meeting.

Self-Help Manual - Dr. George Luz
Community and Individual resource / "Env. Justice Commission"

EPA Reg 3 - States / DOD / EPA
Williamsburg Conf.

(Nonoise.org)
EPA "Levels" document

Feedback on "White paper" - Target audience H/S or Higher
"SubGroup" → Dave @ Jarinko chairs
~~two~~ assemble / review resources

are community's selected / ~~singled~~ out for undesirable env. conditions?

Geo. Harmon
- ~~Rock Spring~~ Rock Spring Power Station - quiet
- Cumberland CSX → 25 ~~hp~~ hp. eng. cam ("yard engines") maintain systems on loco's. (measurements => no audible w/ other activity) main 3000 hp engines can shut down fuel savings / + pollution reduction
- Walter Reed
Air handler / low freq.

*Pres. @ next mtg.

Old Issues - Handout. ~~Adrian~~ Adrian Sawyers

New Issues

- Low Freq Noise - "detectability", not so much level
- resonances - on ~~structures~~ structures "party-wall" (common wall)

Diff. A vs C wtg. - T. Ogle
ref. - P. Schomer - ~~Loudness~~ Loudness Index (HVAC target)
have to use for compliance
~~#~~ Sources - ~~music~~ music primarily, → what else?

- Classroom Acoustics - handout - Dr. Luz.
news article (possible component to self-help Manual)

TOPS FORM 3314
LITHO IN U.S.A.

21

Overview of yearly complaints /

Performance standards → equipment

Enforcement — who should do it / how

TOPS FORM 3314
LITHO IN U.S.A.

Draft

MEETING AGENDA
ENVIRONMENTAL NOISE ADVISORY COUNCIL
AND THE INTERAGENCY NOISE CONTROL COMMITTEE
Monday
December 15, 2003
9:00 AM to 11:30 PM
Aeris Room - Lobby
Maryland Department of the Environment
1800 Washington Blvd.

09:00 Welcome and Introductions – Dr. George Luz, Chair, Noise Advisory Council

09:10 Status of regulations
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AELR – Administrative, Economic, Legislative Review
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→ May 3, 10, or 17 ??
September 13 or 20 ??
December 6, or 13 ??

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11:30 Adjourn

THE WALL STREET JOURNAL.

WEDNESDAY, JULY 30, 2003 B1

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School Districts Spend to Ensure Good Acoustics

By Alex Frangos

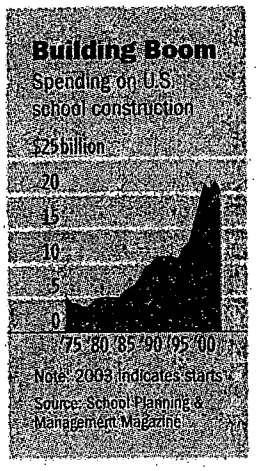
PROPERTY REPORT

AMID THE LARGEST U.S. school-construction boom in a generation, designers and architects are worrying about more than just how classrooms look. They are also concerned about how the rooms sound.

The usual hard-surfaced finishes in classrooms have always created an echo-chamber quality. But recent changes have made matters worse. Indoor air-quality requirements force schools to install noisy heating and cooling equipment. Suburban sprawl brings roads and schools closer together, making traffic noise a problem. And even modern teaching methods, which emphasize group work over lectures, add more voices and more acoustic clutter to the environment.

More than an annoyance, the increasing classroom clatter can be a detriment to education. According to educational experts, poor acoustics are one of the biggest treatable obstacles to learning. Studies have found that students, regardless of hearing ability, perform worse in noisy classrooms than those in quiet ones, even within the same school. And teachers feel it, too, by having to lecture above the racket. They miss an average of two days per year due to vocal fatigue, according to the National Center for Education Statistics.

The effect of poor acoustics is particularly acute among those without full command of speech, including young children and students whose first language isn't English. People in the early stages of language acquisition, be it as a second language or young children, don't have the ability to "fill in the blanks" when they miss a syllable or hear a word incorrectly, says Donna Ellis, head of Washington, D.C.'s efforts to improve acoustics in its classrooms.



Also, the movement to mainstream hearing-impaired students into regular classrooms means there are more pupils with lower baseline auditory ability. And the increased incidence of middle-ear infections means many more grade schoolers experience temporary hearing loss at some point during the school year. "If in that time they teach something like long division, you might miss something crucial," says David Lubman, an acoustical consultant in Westminster, Calif.

One of the fastest-growing school districts in the country, Clark County, Nev., home to Las Vegas and 13 new schools a year, has had stringent acoustical standards since the mid-1980s. The district uses carpeting, suspended acoustical ceilings and walls that go all the way to the roof deck to prevent sound from oozing from one classroom to the next. But in many parts of the country, the acoustical movement is only now starting to take place, in large part advanced by new standards in construction and design guidelines.

Last year, the American National Standards Institute, a Washington nonprofit that administers thousands of voluntary standards, approved acoustical benchmarks to limit background noise and reverberation in schoolhouses. The states of New York and Washington already have similar sound standards. Los Angeles Unified School District, in the middle of a $3.63 billion construction program, has acoustical guidelines for its designers. And it's not just a U.S. movement. The United Kingdom recently adopted standards on classroom noise, and the World Health Organization devised its own guidelines for nations to adopt.

"Acoustics are a critical factor now whenever you are looking at classroom design," says Tim Dufault, principal at Cuningham Group Architecture, a Minneapolis architecture firm.

The new standards have their critics, who say schools can't afford to make every classroom as quiet as can be. And even the staunchest supporters of creating adequate classroom sound acknowledge it adds 0.5% to 2% to an overall construction budget—at a time when local governments are gushing red ink. But thanks to an avalanche of funding measures passed by states and school districts when times were good, schools are one of the few strong spots in the construction industry.

"You have a combination of money already voted on, money not yet spent, and new money that the public seems willing to spend—plus there's simply the pressure of more kids," says Paul Abramson, an educational consultant in Larchmont, N.Y., He predicts school-construction spending will stay near or above $20 billion a year for at least the next few years.

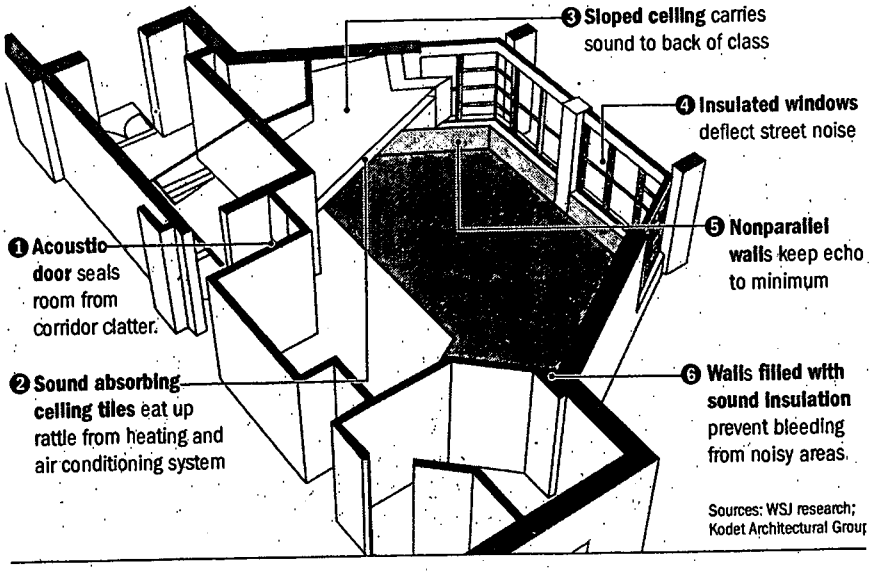
The Burroughs Elementary School in Minneapolis, set to open this fall, will be the first in that city to meet sound-quality targets adopted for new construction in November 2001. Edward Kodet, the architect on the project, says the goal is that the "student who sits in the back can hear as well as the student who sits in the front."

He has done things like add ceilings that slope from front to back so sound "carries, but doesn't echo." The footprint of the rooms, more trapezoid than rectangle, reduces the tendency of sound to reverberate. In terms of materials, the classrooms have double layers of sound-absorbing ceiling tiles, insulated glass windows, and thicker walls where they abut raucous spaces such as stairwells.

Some of the biggest noise culprits in schools are the more-robust heating and air-conditioning systems required in many states for indoor air quality—exactly what spurred Minneapolis to think about sound.

Sound Check

Here are some of the techniques architects are using to cut down classroom noise.



Sources: WSJ research; Kodet Architectural Group

"We had been doing a lot of HVAC [heating, ventilation, air conditioning] renovations, and getting noisy systems that drove us to where we needed to make acoustics a priority," says Lee Setter, environmental specialist for Minneapolis schools.

Such was the case at the Downtown School, a magnet facility in Minneapolis. It was built in 1999 and immediately drew the ire of teachers and parents because of the noise coming from its climate-control system, combined with its open-classroom design. "Not everybody can filter it out," says Lee Fertig, the school's director.

Modifications including larger walls, additional carpeting and sound-absorbing panels, solved the problem. "The noise-interference level went way down," Mr. Fertig says.

Clanging air conditioners are hardly the only problem. Sound bleeds from one room to the next and from outside sources such as highways and airplanes. One design strategy in the fight against noise is to plug holes, as on a ship.

"Sound is like water," says Matt Ciaglo, an architect with Fletcher Thompson Inc. in Hartford, Conn. "It finds the smallest gap." As a matter of course, his firm uses soundproof caulk along seams between drywall and the floor and adds sound-attenuation blankets in the walls.

Further techniques include using different drywall thicknesses—one of them five-eighths of an inch, the other three-quarters of an inch—on either side of a wall. The two widths absorb different sound frequencies and together prevent both low- and high-pitched sounds from getting through. Also, staggering doors in a hallway so classroom entrances aren't directly across from each other and installing carpeting to reduce foot noise can reduce unwanted din.

If acoustic standards for schools were in place nationwide, the additional spending could equal $100 million to $400 million a year, based on current construction spending budgets. As it is, the growing movement has a number of beneficiaries in industy.

Heating and air-conditioning manufacturers, already reaping the benefits of indoor air-quality rules that require their products, now have an additional service to sell—keeping the equipment muffled. "In all types of buildings, as you move to quieter spaces, typically the cost does go up," says Gary Luepke, applications engineer for Trane, a subsidiary of American Standard Cos. that makes indoor climate-control systems.

Also, manufacturers of materials such as acoustic ceilings, carpets, and sound absorbing insulation will see increased demand for their wares. The Carpet and Rug Institute, an industry trade group, puts acoustics at the top of the list in promoting its products to schools. Armstrong World Industries Inc., Lancaster, Pa., has set up an "acoustic calculator" to assist school designers and architects in selecting its products.

The strongest opposition to the new standards comes from the modular-classroom industry, which call them too onerous. "It's not that we don't want quieter standards," says Susan Stewart, a lobbyist for the modular-classroom industry in Sacramento, Calif. "But the cost in some of these areas would be exorbitant."

Not all sound-abatement tactics are costly. Teachers in Washington are known to put old tennis balls on the end of chair legs to eliminate squeaking on the floor when students fidget at their desks.

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Date: 12/10/2003 4:05PM
Subject: DRAFT Agenda

To all:

The attached agenda is DRAFT and may be modified as needed or recommended, but is provided primarily to give all interested parties time to consider issues to be put forth for consideration as topics for next year.

For example, we have had a number of complaints over the past regarding bass frequencies that are discounted in the "A" weighting mode. Given the penetrating nature of the low frequencies, should there be some additional consideration in the standard for certain categories of noise that have these low frequencies?

Please bring your ideas for additional new issues, or old issues that are still unresolved, for discussion on Monday.

George Harman
MD Dept of the Environment, TARSA
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gharman@mde.state.md.us

CC: "Rich Eskin" <reskin@mde.state.md.us>, "Susan Douglas" <sdouglas@mde.state.md.us>

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Draft

MEETING AGENDA
ENVIRONMENTAL NOISE ADVISORY COUNCIL
AND THE INTERAGENCY NOISE CONTROL COMMITTEE
Monday
December 15, 2003
9:00 AM to 11:30 PM
Aeris Room - Lobby
Maryland Department of the Environment
1800 Washington Blvd.

09:00 Welcome and Introductions – Dr. George Luz, Chair, Noise Advisory Council

09:10 Status of regulations
Legal Review –
AELR – Administrative, Economic, Legislative Review
Public Notice
Public Hearing – in conjunction with the next meeting?

09:20 Status of membership and appointments – George Harman

09:30 Status of Community Self-Help Manual – Dr. Luz

09:40 Issues for future discussion
Status of past issues (handout)
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10:15 Break

10:30 Potential guest presenters and subjects

10:45 Schedule selection for 2004 – Mondays ??
May 3, 10, or 17 ??
September 13, or 20 ??
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11:00 Public Presentations

11:30 Adjourn

MEMO

Interagency Noise Comm. MDE 9/15/03

Dec.

Mike Powell - resigned
2 public vacancies =
Deleg. J. M. Jennings - new memb.
Sen. Astle - reappointed

MDept Energy - trial noise assessmt : Geo. Harman
rail, pond activities

Les Bloomberg. (No noise org.)
Linda Gravitz - Chevy Chase
Dr. Mark Blazinski
Community Self-Help Manual - Puts on web site + links.
① Noise Contour maps. - BWI, other airports assess.
③ - Info on traffic noise barriers
- vegetative barriers.
④ - Info. on FHWA publications

Roundtable:

Dec 15th → next mtg.
3 time: May/Sept/Dec.

Draft

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09:00 Welcome and Introductions – Dr. George Luz, Chair, Noise Advisory Council

09:10 Special Presentation and discussion - Ken Fieth – U.S. EPA
Background, overview, comments regarding EPA's Noise Program

10:00 Status of membership and appointments – George Harman
- Resignations
- Appointments

10:15 Break

10:30 Status of Community Self-Help Manual – Dr. Luz

10:40 Status of Regulations - Discussion
- Attorney General Review
- "Fast Lmax" issue ~ NRA (in their manuals).

10:50 Round Table Discussion of:
- Issues to be discussed
- Potential guest presenters and subjects

11:15 Next meeting – December 15th

11:15 Public Presentations

11:30 Adjourn

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going to MD Register by (Dec..)

.01 Definitions.

A – E. (text unchanged)

old text removed

F. "Decibel (dB)" means a unit of measure equal to ten times the logarithm to the base ten of the ratio of a particular sound pressure squared to a standard reference pressure squared.

new text

the square of the sound pressure to the square of a standard reference pressure. **For the purpose of this subtitle, 20 micropascals shall be the standard reference pressure.**

G. – L. (text unchanged)

L.1 "IEC" means International Electrotechnical Commission.

M. – O. (text unchanged)

P. "Periodic noise" means noise possessing a repetitive on-and-off characteristic.

with a rapid rise to maximum and a short decay not exceeding two seconds.

Q – R. (text unchanged)

S. "Sound level" means, in decibels, the weighted sound pressure level measured by the use of a sound level meter satisfying the requirements of ANSI S1.4 1971 "Specifications for Sound Level Meters". Sound level and noise level are synonymous. The weighting employed shall always be specified.

T. "Sound level meter" means an instrument, meeting ANSI S1.4 1971 "Specifications for Sound Level Meters", International Electrotechnical Commission and National Standards Institute standards **comprising a microphone, an amplifier, an output meter, and frequency-weighting network(s) that is used for the measurement of sound pressure levels in a specified manner.**

U. Sound Pressure.

(1) "Sound pressure" means the minute fluctuations in atmospheric pressure which accompany the passage of a sound wave.

(2) [For a steady sound, the value of the sound pressure average over a period of time]

[(3)] Sound pressure is usually measured in dynes per square centimeter (dyne/cm^2), or in newtons per square meter (N/m^2), or in micropascals.

V. "Sound pressure level" means, in decibels, 20 times the logarithm to the base ten of the ratio of a sound pressure to the reference sound pressure of 20 micropascals (20 micronewtons per square meter). In the absence of any modifier, the [level]

pressure

is understood to be that of a root-mean-square pressure.

W. – X. (text unchanged)

Y. "Zoning district" means a general land use category, defined according to local subdivision, the activities and uses for which are generally uniform throughout the subdivision. For the purposes of this regulation, property which is not zoned ["residential", "commercial", or "industrial",]

"industrial", "commercial", or "residential"

shall be classified according to use as follows:

[(1) "Commercial" means property used for buying and selling goods and services;

(2) "Industrial" means property used for manufacturing and storing goods;]

(1) "Industrial" means property used for manufacturing and storing goods;

(2) "Commercial" means property used for buying and selling goods and services;

(3) "Residential" means property used for dwellings.

.02 Environmental Noise Standards. (text unchanged)

.03 General Regulations.

A. Noise and Vibration Prohibitions.

(1) A person may not cause or permit noise levels which exceed those specified in Table 2 except as provided in §A(2) or (3), or §B, below.

Table 2
Maximum Allowable Noise Levels (dBA)
for Receiving Land Use Categories

(Measured as Fast L_{MAX})

Effective Date	*Day/Night*	*Industrial*	*Commercial*	*Residential*
Upon Adoption	Day	75	67	65
	Night	75	62	55

A. (2) – (4) (text unchanged)

(5) A person shall not operate or permit to be operated an off-road internal combustion engine powered recreational vehicle, to include, but not limited to a dirt bike, all terrain vehicle, go cart, snowmobile or similar vehicles, on private property, closer than 300 feet to a neighboring residence or the associated curtilage without the written permission of the affected resident, unless it can be demonstrated to the department that the vehicle can be operated within the noise limits specified in Table 2 of this regulation.

B. Exemptions.

(1) The provisions of this regulation may not apply to devices used solely for the purpose of warning, protecting, or alerting the public, or some segment thereof, of the existence of an emergency or hazardous situation.

(2) The provisions of this regulation do not apply to the following:

(a) Household tools and portable appliances in normal usage[7] <u>during daytime hours.</u>

B. (b) – (i) (text unchanged)

(j)[Sound not electronically amplified created by sporting, amusement, and entertainment events and other public gatherings operating according to terms and conditions of the appropriate local jurisdictional body. This includes but is not limited to athletic contests, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. This exemption only applies between the hours of 7 a.m. and 12 midnight.]

<u>Sound, except those sounds that are electronically amplified, created by sporting events (except trap shooting, skeet shooting, or other target shooting), entertainment events and other public gatherings operating under permit or permission of the appropriate local jurisdiction. This includes but is not limited to athletic contents, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. This exemption only applies between the hours of 7am and midnight. In Frederick County or Frederick City, a fair listed in the Maryland agricultural fairs and shows schedule that is maintained by the Maryland Agricultural Fair Board, or any other event held on the same grounds and listed by the Agricultural Fair Board shall be exempt from State noise regulations.</u>

B. (k) – (m) (text unchanged)

<u>(n) Household pets on residential property that are maintained in accordance with local zoning requirements.</u>

(o) Trap shooting, skeet shooting, or other target shooting between the hours of 9 AM and 10 PM on any range or other property of a shooting sports club that is chartered and in operation as of January 1, 2001. This exemption does not apply in Allegany, Anne Arundel, Baltimore City, Calvert, Charles, Garrett, Howard, Montgomery, St. Mary's and Washington Counties.

(p) Trash collection operations between the hours of 7 AM and 10 PM.

C. (1) – (6) (text unchanged)

7. Applicants shall be responsible for public hearing costs, as directed by the department, to include the hearing advertisement, facility rental, court reporter, and the preparation of the transcript of the hearing.

D. Measurement.

(1) The equipment and techniques employed in the measurement of noise levels may be those recommended by the Department, which may, but need not, refer to currently accepted standards or recognized organizations, including, but not limited to, the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), Society of Automotive Engineers (SAE),

International Electrotechnical Commission (IEC) **and the United States Environmental Protection Agency (EPA).**

D. (2) (text unchanged)

(3) Sound level meters used to determine compliance with Regulation .04 shall meet or exceed the specifications of the American National Standards Institute or its successor bodies ANSI S1.4-1971 for Type II sound level meters.

.04 Emission Regulations. (text unchanged)

Reserved.

.05 Penalties. (text unchanged)

DRAFT FORMAT
MARYLAND NOISE MANAGEMENT TOOLBOX
September 15, 2003

NOTE: Items in bold can be found on the draft CD. Other items are under consideration.

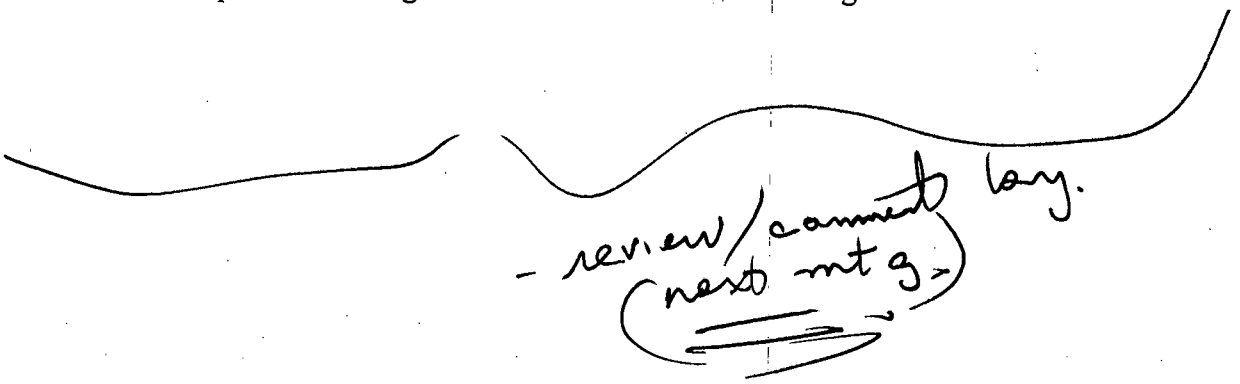
1. Regulating Noise through Laws
   - **a.** Maryland Noise Ordinance
   - **b.** Comments on the USEPA's Model Noise Ordinance
   - **c.** **Noise Ordinance Compliance Fact Sheet (Montgomery County)**

2. Choosing a Suitable Noise Environment for You and Your Family
   - a. Predicting neighborhood noise level from Maryland census tract data
   - **b.** **Selecting a Quiet Home or Apartment (USEPA, 1978)**
   - **c.** Noise contour maps for Maryland airports and Federal facilities.
   - **d.** How to know whether you are "noise-sensitive"

3. Reducing Interior Noise Levels in a Noisy Neighborhood
   - **a.** **How to Insulate Your Home against Outdoor Noise (USEPA, 1978)**
   - **b.** **Sound Insulating Homes Against Aircraft Noise (National Research Council, Canada, 1998)**
   - **c.** About traffic noise barriers
   - **d.** About vegetative barriers
   - **e.** Simple noise solutions from the Maryland Noise Office

4. Preventing Noise Problems through Land Use Planning
   - **a.** **Quiet Communities: Minimizing the Effects of Noise through Land Use Controls (National Association of Counties, March 1979)**
   - **b.** **Quiet Communities II: County Land Use Programs for Noise Control (National Association of Counties, September 1980)**

5. Tips on Choosing a Professional Noise Control Engineer



From: "George Harman" <gharman@mde.state.md.us>
To: <LizE061925@aol.com>, <George.Luz@APG.AMEDD.ARMY.MIL>, <peppinr@asme.org>, <oglet@co.mo.md.us>, <bayroad@comcast.net>, <jcherry101@comcast.net>, <mharton@comcast.net>, <John.Quinn@constellation.com>, <pamelae@dhmh.state.md.us>, <zeleskc@dhmh.state.md.us>, <fsherbert@dnr.state.md.us>, <mcdavis@dnr.state.md.us>, <erniekent@earthlink.net>, <fschmitz@eng.umd.edu>, <stc921jhnsn@erols.com>, <valeriec.mdfb@erols.com>, <burner@friend.ly.net>, <ronelson@friend.ly.net>, <mpowell@gfrlaw.com>, <sharon_grosfeld@house.state.md.us>, <sandyw@iximd.com>, <staff@jphuntinglodge.com>, <jmiedusiewski@mail.semmes.com>, <twilliams@mdbusiness.state.md.us>, <MJames@MDChamber.org>, <EFavazza@mdcounties.org>, <djarinko@mde.state.md.us>, "Mike Griffen" <mgriffen@mde.state.md.us>, <rfield@mde.state.md.us>, "Susan Douglas" <sdouglas@mde.state.md.us>, <CandaceD@mdmunicipal.org>, <jnoonan@mdp.state.md.us>, <staianoengrg@mindspring.com>, <jcaffey@mmhaonline.org>, <Mark.Pfefferle@mncppc-mc.org>, <dshonerd@multistate.com>, <michael.begly@ngc.com>, <william.grabau@osha.gov>, <Dorothy.Guy@piperrudnick.com>, <roger.truitt@piperrudnick.com>, <john_astle@senate.state.md.us>, <kpolcak@sha.state.md.us>, <ACE@stateside.com>, <jes@stateside.com>, <mbabuild@toad.net>, <rgsmith@venable.com>, <cfsf123@yellowbananas.com>
Date: 09/12/2003 1:40PM
Subject: Noise Council reminder - Monday Sept 15

Last minute reminder:
The Noise Advisory Council and Interagency Noise Control Committee will meet on Monday Sept 15th at 9:00 am as indicated in the attached DRAFT agenda.

Final adjustments will be made to the agenda on Monday.

Hope to see you there.
George

<<<<GWIASIG 0.07>>>>

CC: "Rich Eskin" <reskin@mde.state.md.us>

Draft

MEETING AGENDA
ENVIRONMENTAL NOISE ADVISORY COUNCIL
AND THE INTERAGENCY NOISE CONTROL COMMITTEE

Monday
September 15, 2003
9:00 AM to 11:30 PM
Aeris Room - Lobby
Maryland Department of the Environment
1800 Washington Blvd.

09:00 Welcome and Introductions – Dr. George Luz, Chair, Noise Advisory Council

09:10 Special Presentation and discussion - Ken Fieth – U.S. EPA
Background, overview, comments regarding EPA's Noise Program

10:00 Status of membership and appointments – George Harman
- Resignations
- Appointments

10:15 Break

10:30 Status of Community Self-Help Manual – Dr. Luz

10:40 Status of Regulations - Discussion
- Attorney General Review
- "Fast Lmax" issue

10:50 Round Table Discussion of:
- Issues to be discussed
- Potential guest presenters and subjects

11:15 Next meeting – December 15th

11:15 Public Presentations

11:30 Adjourn

Maryland Department of the Environment (MDE)
1800 Washington Blvd.
Baltimore, MD 21230-1718

August 11, 2003

Maryland Noise Control Program Briefing

Welcome and introductions ---------- Stanley Tsai, MDE

Maryland Overview ---------- George Harman, MDE

Maryland Department of Transportation ---------- Kenneth Polcak, State Highway Admin.

Maryland Department of the Environment --------- George Harman

Open Discussion and Questions

Visitors:
Ms. Amy I-Chun Lin
iclin@sun.epa.gov.tw
Environmental Protection Administration
Taiwan, R.O.C.
Phone: 02-23117722 ext. 2797

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Office of International Affairs (OIA 2650R)
U.S. Environmental Protection Agency
1300 Pennsylvania Ave.
Washington, D.C. 20004
Phone: (202)564-6429

Maryland Participants:

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Office of Environmental Design
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Maryland Department of the Environment
Noise Control Program

George Harman – Program Manager
Dave Jarinko – Noise Control Specialist

MDE

Outline

- Current situation – Noise Advisory Council
- Overview of Statute
- Overview of Regulations
- Examples of Complaints
- Options for resolution of complaints
- Options for prevention
- MDE support

Noise Basics

- Noise- sound and vibration caused by sub-audible frequencies
- Measurement unit is the decibel - dB
- A-weighted decibel scale, adjusted noise levels to reflect human hearing potential - dBA
- L_{dn} - day-night average
- Daytime - 7 am to 10 pm
- Audible range – 16 to 20,000 hertz or cycles per second
- Octave Band, 1/3 Octave – segments of spectrum

Current Situation

- Escalating Complexity in Complaints
- Main Issues
  - Continuous noise
  - Vibrations
  - Gun clubs
  - Auto racing facilities
- 25-year old statute and regulations

Delegation of Responsibilities

- DNR – Waterway and Watercraft Noise
- SHA – General Road Noise
- MVA – Vehicle Noise
- MSP – Vehicle Noise Enforcement
- MDE – Fixed facilities and off road noise
- Local Governments – domestic issues

Environment Article, Title 3

- Definitions
- Intent-
  - Environment free from noise that may jeopardize: health, general welfare, or property, or degrades the quality of life
  - Work cooperatively with political subdivisions

Environment Article, Title 3

- **Responsibilities of the Department**
  - Develop a plan
  - Coordinate all State agency programs
  - Maintain records of local programs
- **Responsibilities of local subdivisions**
  - Local standards not less stringent
  - Selective authority for gun ranges
  - Local program descriptions to MDE

Environment Article, Title 3

- Environmental Noise Advisory Council
- Interagency Noise Advisory Committee
- Currently meeting at MDE
  - July 16 – 9:00 to 3:00
  - September 10 – time pending
  - Generally - first Monday 9:00 to 12:00

Considerations in Regulations

- Public health, safety, and welfare with a margin of safety
- Hearing loss potential
- Interference with sleep
- Adverse psychological responses
- Harm to animal life
- Devaluation of property
- Unreasonable interferences with the enjoyment of life

Adoption of Regulations

- Nature and zoning of affected areas
- Nature and source of noise
- Noise reduction potentials
- Measurement capabilities
- Cost of compliance
- May not prohibit trap shooting, in Fred. Co. where the Dept. of Planning And Zoning has approved a site

Adoption of Regulations

- Heat pumps and air conditioners – may not exceed 75 and 70 dB, respectively
- May not prohibit trap shooting , etc. as previously mentioned
- May not apply to construction or repair on public property, or to fire station alerting
- Adoption must comply with Administrative Procedures Act with 60 days of notice and public inspection

Enforcement

- Corrective Orders
- Injunctive actions – prior notice and reasonable time to comply
- Civil penalty – up to $10,000 per day
- Plan for Compliance – no penalty while acting under an approved plan
- Acts of God are not regulated

Regulations

Code of Maryland Regulations
Title 26, Subtitle 02, Chapter 03
Control of Noise Pollution

Regulations

- Preface
- Definitions
- Standards and Goals
  - Goals by district – average standards
  - Industrial — 70 dBA $L_{eq}(24)$
  - Commercial — 64 dBA L_{dn}
  - Residential — 55 dBA L_{dn}

Regulatory Exemptions - 1

- Warning devices
- Household tools
- Lawn and snow equipment
- Agricultural field machinery
- Blasting operations
- Vehicles on highways
- Aircraft
- Boats

Regulatory Exemptions - 2

- Emergency operations
- Pile driving equipment
- Non electronically amplified sound from:
- Sporting events
- Amusement
- Entertainment
- Locally approved local gatherings
- Athletic contests

Regulatory Exemptions - 3

- Carnivals
- Fairgrounds
- Sanctioned auto racing (regulated midnight to 7 am)
- Rail operations
- Construction on public property
- Air conditioning equipment

Regulations

- Civil Penalties $10,000 per day
- Variances
- Measurements - procedures
- Civil penalty
- Plan of Compliance

Examples - 1

- Nursing Home / Hospitals (several valid complaints have been observed)
- Dirt Bikes – riding legally but too close to homes
- Bands – clubs, taverns, bars, restaurants
- Swimming pool pumps

Examples - 2

- Early morning construction noise/prior to 7:00 a.m.
- Power sweepers at night
- Reefer units/truck noise/shopping centers
- Gun clubs - 14 Counties are exempt / 9 Counties are subject to the noise regulations.

Examples - 3

- Early morning trash pickup
- Commercial and industrial equipment noise
- Paging loud speakers – car dealerships – fast food restaurants
- Church bells
- Barking dogs – MDE will only handle commercial kennel complaints
- Etcetera

Examples - 4

- Vehicle boom-box noise
- Complaints should be handled by local police as a traffic citation
- If the sound can be heard at a distance of 50 feet or more, no sound level measuring equipment is required.

Options for resolution of complaints

- 99% of complaints handled with nothing more than notification and voluntary compliance
- MDE may file a civil action
  - Penalty
  - injunction
- Individual may file private nuisance complaint
- MDE may file public nuisance complaint

Options for resolution of complaints

- Negotiations
- Compliance Plan
- Dispute Resolution
- Variance Request

Options for prevention

- Zoning
- Set backs
- Building Permits
  - Check off boxes
- Environmental Assessment
- Sound evaluation

Plea From MDE

- Sound is a pollutant
- Being there first doesn't count
  - Water pollution is a good example
- Psychological stress is real
- Neighbors need to be respectful
  - Residential to residential - domestic situations
  - Business to residential

Support from MDE

- Training
- Measurements
- Expert testimony
- Regulation development

In Summary

- Domestic Problems need police involvement
- Zoning decisions need noise considerations
- Building approval process needs noise assessments

Final Summary

Prevention
Prevention
Prevention

QUESTIONS

MDE

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Date: 07/28/2003 12:27PM
Subject: Noise Council minutes - final draft regulations

To all:

The two attachments contain the draft minutes from the June meeting and the latest version of the proposed changes to the regulations.

The most recent additions to the regulations are believed to be simply needed editorial changes. They should appear a "blue". Some editorial changes in the Ldn formula may also be noted (changed a "+" to "divided by", but they are not in blue. Comments on all of these changes would be appreciated prior to our final formal submittal for change.

There have been no new appointees to the Council or Committee, but if any do occur, they will be briefed on all issues prior to the proposed regulations being adopted.

Our next meeting is scheduled for September 15th. If you have any requests for presentations, or would like to offer a presentation, please let me know.

Please call if you have any questions.

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Draft for Discussion Only

Regulatory Change Proposals
July 25, 2003

Title 26

DEPARTMENT OF THE ENVIRONMENT

Subtitle 02 OCCUPATIONAL, INDUSTRIAL, AND RESIDENTIAL HAZARDS

Chapter 03 Control of Noise Pollution

Authority: Environment Article §3-401,
Annotated Code of Maryland

Preface

The Environmental Noise Act of 1974 of the State of Maryland declares as policy the limitation of noise to that level which will protect the health, general welfare, and property of the people of the State. It requires that the Department assume responsibility for the jurisdiction over the level of noise, and prepare regulations for the control of noise, including the establishment of standards for ambient noise levels and equipment performance with respect to noise, for adoption by the Secretary of the Environment. Enforcement of the regulations and standards is the responsibility of the Department in all areas, using the facilities and services of local agencies within the areas to the greatest extent possible. The Department shall coordinate the programs of all State agencies relating to noise abatement, and each State agency prescribing sound level limits or regulations respecting noise shall obtain the endorsement of the Department in prescribing any limits or regulations.

.01 Definitions.

A. "ANSI" means American national standards institute or its successor bodies.

B. "Construction" means any site preparation, assembly, erection, repair, alteration, or similar activity.

C. "Day-night average sound level (L_{dn})" means in decibels, the energy average sound level for a 24-hour day with a 10 decibel penalty applied to noise occurring during the nighttime period; i.e., noise levels occurring during the period from 10 p.m. one day until 7 a.m. the next are treated as though they were 10 dBA higher than they actually are. The use of the A-weighting is understood. The mathematical expression for L_{dn} is as follows:

$$L_{dn} = 10\log_{10}\left[\left(\frac{15}{24}\right)10^{Ld/10} + \left(\frac{9}{24}\right)10^{(L_n+10)/10}\right]$$

Where L_d = the daytime average sound level.

L_n = the nighttime average sound level.

D. "dBA" means abbreviation for the sound level in decibels determined by the A-weighting network of a sound level meter or by calculation from octave band or one-third octave band data.

E. "Daytime hours" means 7 a.m. to 10 p.m., local time.

F. "Decibel (dB)" means a unit of measure equal to ten times the logarithm to the base ten of the ratio of ~~a particular sound pressure squared to a standard reference pressure squared.~~ THE SQUARE OF THE SOUND PRESSURE TO THE SQUARE OF A STANDARD REFERENCE PRESSURE. For the purpose of this subtitle, 20 micropascals shall be the standard reference pressure.

G. "Demolition" means any dismantling, destruction, or removal activities.

H. "Department" means the Department of the Environment.

I. "Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage, which demands immediate action.

J. "Environmental noise" means the noise that exists at any location from all sources.

K. "Environmental noise standards" means the goals for environmental noise, the attainment and maintenance of which, in defined areas and under specific conditions, are necessary to protect the public health and general welfare.

L. "equivalent sound level" (also "average sound level") means the level of a constant sound which, in a given situation and time period, would convey the same sound energy as does the actual time-varying sound during the same period. Equivalent sound level is the level of the time weighted, mean-square, A-weighted sound pressure. A numerical subscript may be used to indicate the time period under consideration; i.e., $L_{eq}(24)$ or $L_{eq}(8)$ for 24-hour and 8-hour periods, respectively. No subscript indicates a 24-hour period. The mathematical expression for the L_{eq} is as follows:

$$L_{eq} = 10\log_{10}\left[\frac{1}{t_2 - t_1}\int_{t_1}^{t_2} 10^{L_A(t)/10}\,dt\right] \quad (dBA)$$

Where t_1 and t_2 are the beginning and ending times, respectively, of the period over which the average is determined, and $L_A(t)$ is the instantaneous A-weighted sound pressure level fluctuating with time.

M. "Nighttime hours" means 10 p.m. to 7 a.m., local time.

N. "Noise" means the intensity, frequency, duration and character of sound, including sound and vibration of sub-audible frequencies.

O. "Noise pollution" means the presence of noise of sufficient loudness, character, and duration, which whether from a single source or multiple sources, is, or may be predicted with reasonable certainly to be, injurious to health or which unreasonably interferes with the proper enjoyment of property or with any lawful business or activity.

P. "Periodic noise" means noise possessing a repetitive on-and-off characteristic **WITH A RAPID RISE TO MAXIMUM ~~PEAK~~ AND A SHORT DECAY NOT EXCEEDING 2 SECONDS.**

Q. "Person" means any individual, group of individuals, firm, partnership, voluntary association, or private, public, or municipal corporation, or political subdivision of the State, or Department, bureau, agency, or instrument of federal, State, or local government, responsible for the use of property.

R. "Prominent discrete tone" means any sound, which can be distinctly heard as a single pitch or a set of single pitches. For the purposes of this regulation, a prominent discrete tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the 2 contiguous one-third octave bands by 5 dB for center frequencies of 500 Hz and above and by 8 dB for center frequencies between 160 and 400 Hz and by 15 dB for center frequencies less than or equal to 125 Hz.

S. "Sound level" means, in decibels, the weighted sound pressure level measured by the use of a sound level meter. ~~satisfying the requirements of NASI S1.4 1971 "specifications for sound level meters"~~. Sound level and noise level are synonymous. The weighting employed shall always be specified.

T. "Sound level meter" means an instrument, meeting INTERNATIONAL ELECTROTECHNICAL COMMISSION AND AMERICAN NATIONAL STANDARDS INSTITUTE standards ~~ANSI S1.4 1971 "specifications for sound level meters"~~, comprising a microphone, an amplifier, an output meter, and frequency-weighting network(s) that is used for the measurement of sound pressure levels in a specified manner.

U. Sound pressure

1. "Sound pressure" means the ~~minute~~ fluctuations in atmospheric pressure, which accompany the passage of a sound wave.

~~2. For a steady sound, the value of the sound pressure average over a period of time.~~

2~~3~~. Sound pressure is usually measured in dynes per square centimeter ($dyne/cm^2$), or in newtons per square meter (N/m^2), or in micropascals (μPa).

V. "Sound pressure level" means, in decibels, 20 times the logarithm to the base ten of the ratio of a sound pressure to the reference sound pressure of 20 micropascals (20 micronewtons per square meter). In the absence of any modifier, the PRESSURE ~~level~~ is understood to be that of a root-mean-square pressure.

W. "Source" means any person or property, real or personal, contributing to noise pollution.

X. "Vibration" means any oscillatory motion of solid bodies.

Y. "Zoning district" means a general land use category, defined according to local subdivision, the activities and uses for which are generally uniform throughout the subdivision. For the purposes of this regulation, property which is not zoned "residential", "commercial", or "industrial", shall be classified according to use as follows:

(1) "Commercial" means property used for buying and selling goods and services;

(2) "Industrial" means property used for manufacturing and storing goods;

(3) "Residential" means property used for dwellings.

References for T. "Sound Level meter":

a. ANSI[1] S1.4-1983 (R 2001), American National Standard for Sound Level Meters
b. ANSI S1.43-1997 (R2002), American National Standard Specifications for Integrating-Averaging Sound Level Meters
c. IEC[2] 60651 Ed.1.2 b:1994, Sound level meters, International Electrotechnical Commission (IEC).
d. IEC 60804 Ed. 2.0 b:2000, Integrating-averaging sound level meters
e. IEC 61672-1:2002, "Electroacoustics- Sound level meters-Part 1: Specifications.

.02 Environmental Noise Standards.

A. Precepts.

(1) It is known that noise above certain levels is harmful tot he health of humans. Although precise levels at which all adverse health effects occur have not definitely been ascertained, it is known that one's well-being can be affected by noise through loss of sleep, speech interference, hearing impairment, and a variety of other psychological and physiological factors. The establishment of ambient noise standards, or goals, must provide margins of safety in reaching conclusions based on available data which relate noise exposure to health and welfare effects, with due consideration to technical and economic factors.

(2) The environmental noise standards set forth here represent goals expressed in terms of equivalent A-weighted sound levels which are protective of the public health and welfare. The ambient noise levels shall be achieved through application, under provisions of laws or regulations or otherwise, of means for reducing noise levels including, but not limited to, isolation of noise producing equipment, dampening of sound waves by insulation, equipment modification and redesign, and land use management.

B. Standards for Environmental Noise--General.

(1) The standards are goals for the attainment of an adequate environment. The standards set out in regulation .03 are intended to achieve these goals.

(2) The following sound levels represent the standards for the State by general zoning district:

Table 1
Environmental Noise Standards

Zoning district	*Level*	*Measure*
Industrial	70 dBA	$L_{eq}(24)$
Commercial	64 dBA	L_{dn}
Residential	55 dBA	L_{dn}

.03 General Regulations.

A. Noise and vibration prohibitions.

(1) A person may not cause or permit noise levels which exceed those specified in table 2 except as provided in §A (2) or (3), or §B, below.

Table 2
Maximum Allowable Noise Levels (dBA)
For Receiving Land Use Categories

Effective date	*Day/Night*	*Industrial*	*Commercial*	*Residential*
	Day	75	67	65

[1] American National Standards Institute (ANSI), 25 W 43rd St, New York, NY 10036
[2] International Electrotechnical Commission (IEC), Geneva, Switzerland [I need to check this] available from, Acoustical Society of America, 35 Pinelawn Rd, #114E, Melville, NY 11747

Upon Adoption	Night	75	62	55

(2) A person may not cause or permit noise levels emanating from construction or demolition site activities, which exceed:

(a) 90 dBA during daytime hours;

(b) The levels specified in table 2 during nighttime hours

(3) A person may not cause or permit the emission of prominent discrete tones ~~and~~ **OR** periodic noises which exceed a level which is 5 dBA lower than the applicable level listed in Table 2.

(4) A person may not cause or permit beyond the property line of a source, vibration of sufficient intensity to cause another person to be aware of the vibration by such direct means as sensation of touch or visual observation of moving objects. The observer shall be located at or within the property line of the receiving property when vibration determinations are made.

(5) **A PERSON SHALL NOT OPERATE OR PERMIT TO BE OPERATED AN OFF-ROAD INTERNAL COMBUSTION ENGINE POWERED RECREATIONAL VEHICLE, TO INCLUDE, BUT NOT LIMITED TO A DIRT BIKE, ALL TERRAIN VEHICLE, GO CART, SNOWMOBILE OR SIMILAR VEHICLES, ON PRIVATE PROPERTY, CLOSER THAN 300 FEET TO A NEIGHBORING RESIDENCE OR THE ASSOCIATED CURTILAGE WITHOUT THE WRITTEN PERMISSION OF THE AFFECTED RESIDENT, UNLESS IT CAN BE DEMONSTRATED TO THE DEPARTMENT THAT THE VEHICLE CAN BE OPERATED WITHIN THE NOISE LIMITS SPECIFIED IN TABLE 2 OF THIS REGULATION.**

B.~~b~~. Exemptions.

(1) The provisions of this regulation may not apply to devices used solely for the purpose of warning, protecting, or alerting the public, or some segment thereof, of the existence of an emergency **OR HAZARDOUS** situation.

(2) The provisions of this regulation do not apply to the following:

(a) Household tools and portable appliances in normal usage **DURING DAYTIME HOURS.**

(b) Lawn care and snow removal equipment (daytime only) when used and maintained in accordance with the manufacturer's specifications.

(c) Agricultural field machinery when used and maintained in accordance with the manufacturer's specifications.

(d) Blasting operations for demolition, construction, and mining or quarrying (daytime only).

(e) Motor vehicles on public roads.

(f) Aircraft and related airport operations at airports licensed by the State aviation administration.

(g) Boats on State waters or motor vehicles on State lands under the jurisdiction of the Department of natural resources.

(h) Emergency operations.

(I) Pile driving equipment during the daytime hours of 8 a.m. to 5 p.m.

~~(j) Sound not electronically amplified created by sporting, amusement, and entertainment events and other public gatherings operating according to terms and conditions of the appropriate local jurisdictional body. This includes but is not limited to athletic contests, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. This exemption only applies between the hours of 7 a.m. and 12 midnight.~~

(J) SOUND, EXCEPT THOSE SOUNDS THAT ARE ELECTRONICALLY AMPLIFIED, CREATED BY SPORTING EVENTS (EXCEPT TRAP SHOOTING, SKEET SHOOTING, OR OTHER TARGET SHOOTING), ENTERTAINMENT EVENTS AND OTHER PUBLIC GATHERINGS OPERATING UNDER PERMIT OR PERMISSION OF THE APPROPRIATE LOCAL JURISDICTION. THIS INCLUDES BUT IS NOT LIMITED TO ATHLETIC CONTESTS, AMUSEMENT PARKS, CARNIVALS, FAIRGROUNDS, SANCTIONED AUTO RACING FACILITIES, PARADES, AND PUBLIC CELEBRATIONS. THIS EXEMPTION ONLY APPLIES BETWEEN THE HOURS OF 7 AM AND MIDNIGHT. IN FREDERICK COUNTY OR FREDERICK CITY, A FAIR LISTED IN THE MARYLAND AGRICULTURAL FAIRS AND SHOWS SCHEDULE THAT IS MAINTAINED BY THE MARYLAND AGRICULTURAL FAIR BOARD, OR ANY OTHER EVENT HELD ON

THE SAME GROUNDS AND LISTED BY THE AGRICULTURAL FAIR BOARD SHALL BE EXEMPT FROM STATE NOISE REGULATIONS.

(k) Rapid rail transit vehicles and railroads.

(l) Construction and repair work on public property.

(m) Air conditioning or heat pump equipment used to cool or heat housing on residential property. For this equipment, a person may not cause or permit noise levels which exceed 70 dBA for air conditioning equipment at receiving residential property and 75 dBA for heat pump equipment at receiving residential property.

(N) HOUSEHOLD PETS ON RESIDENTIAL PROPERTY THAT ARE MAINTAINED IN ACCORDANCE WITH LOCAL ZONING REQUIREMENTS.

(O) TRAP SHOOTING, SKEET SHOOTING, OR OTHER TARGET SHOOTING BETWEEN THE HOURS OF 9 AM AND 10 PM ON ANY RANGE OR OTHER PROPERTY OF A SHOOTING SPORTS CLUB THAT IS CHARTERED AND IN OPERATION AS OF JANUARY 1, 2001. THIS EXEMPTION DOES NOT APPLY IN ALLEGANY, ANNE ARUNDEL, BALTIMORE CITY, CALVERT, CHARLES, GARRETT, HOWARD, MONTGOMERY, ST. MARY'S AND WASHINGTON COUNTIES.

(P) TRASH COLLECTION OPERATIONS BETWEEN THE HOURS OF 7 AM AND 10 PM.

Ce. Variance procedure.

(1) Any person who believes that meeting the requirements of §A, above, is not practical in a particular case may request an exception to its requirements.

(2) Requests submitted to the Department shall be in writing and shall include evidence to show that compliance is not practical.

(3) Upon receipt of a request for an exception, the Department shall schedule a hearing to be held within 60 days.

(4) The applicant for the exception, at least 30 days before the hearing date, shall advertise prominently the hearing by placing a notice in a newspaper of general circulation in the subdivision in which the facility or source for which the exception is sought is located. The notice shall include the name of the facility or source and such additional information as the Department may require.

(5) Based upon evidence presented at the hearing, the secretary may grant an exception to §A, above, for a period not to exceed 5 years under terms and conditions appropriate to reduce the impact of the exception.

(6) Exceptions shall be renewable upon receipt by the Department of evidence that conditions under which the exception was originally granted have not changed significantly.

(7) APPLICANTS SHALL BE RESPONSIBLE FOR PUBLIC HEARING COSTS, AS DIRECTED BY THE DEPARTMENT, TO INCLUDE THE HEARING ADVERTISEMENT, FACILITY RENTAL, COURT REPORTER, AND THE PREPARATION OF THE TRANSCRIPT OF THE HEARING.

Dd. Measurement

(1) The equipment and techniques employed in the measurement of noise levels may be those recommended by the Department, which may, but need not, refer to currently accepted standards or recognized organizations, including, but not limited to, the American National Standard Institute (ANSI), American Society for Testing and Materials (ASTM), Society of Automotive Engineers (SAE), and the United States Environmental Protection Agency (EPA).

(2) The measurement of noise levels shall be conducted at points on or within the property line of the receiving property or the boundary of a zoning district, and may be conducted at any point for the determination of identity in multiple source situations.

(3) Sound level meters used to determine compliance with regulation .03 shall meet or exceed the specifications FOR TYPE 2 ~~of the American National Standards Institute or its successor bodies ANSI s1.4-1971 for type ii~~ sound level meters.

.04 Emission Regulations.
Reserved.

.05 penalties

a. Civil penalty. Any person who willfully violates these regulations shall be liable to a civil penalty of not more than $10,000. Each day during which a violation continues there shall be liability for a separate penalty.

b. Plan for compliance. A violator who has submitted a plan for compliance with these regulations and has that plan or amendments to it approved by the secretary, upon recommendation of the Department, may not be considered to be in violation of these regulations as long as he acts in accordance with the original or amended plan.

Administrative history
Effective date August 6, 1975 (2:17 Md. R. 1189)

Regulation .01A-1, W-1 adopted effective February 15, 1982 (9:3 M. R. 222); repealed effective March 28, 1983 (10:6 Md. R. 558)

Regulations .01 and .03A, B, D amended effective September 14, 1977 (4:19 Md. R. 1468)

Regulation .01C amended effective march 28, 1983 (10:6 M. R. 558)

Regulations .01C, Q; .02B; .03B, D amended effective February 15, 1982 (9:3 Md. R. 222)

Regulation .03A amended as an emergency provision effective November 13, 1979 (6:24 Md. R. 1917); emergency status expired Mach 29, 1980

Regulation .03A and B amended effective March 28m, 1983 (10:6 Md. R. 558)

Regulation .04 repealed effective September14, 1977 (4:19 Md. R. 1468)

Chapter recodified from COMAR 10.20.01 to COMAR 26.02.03

ANNOTATED CODE OF MARYLAND
Article - Environment
TITLE 3
NOISE CONTROL

Subtitle 1. Definitions; General Provisions

§ 3-101. Definitions

(a) In this title the following words have the meanings indicated.
(b) "Committee" means the Interagency Noise Control Committee.
(c) "Council" means the Environmental Noise Advisory Council.
(d) "Environmental noise standard" means a goal for the limitation of noise, from all sources, that exists in a defined area under specified conditions.
(e) (1) "Noise" means the intensity, frequency, duration, and character of sound.
(2) "Noise" includes sound and vibration of subaudible frequencies.
(f) "Political subdivision" means a county or municipal corporation of this State.
(g) "Sound level limit" means the maximum allowable noise emission from a noise source in a defined area under specified conditions.
(h) "Source" means any person or property from which sound originates.

§ 3-102. Legislative Policy

(a) The General Assembly finds:
(1) That the people of this State have a right to an environment that is free from any noise that:
(i) May jeopardize their health, general welfare, or property; or
(ii) Degrades the quality of their lives;
(2) That there is a substantial body of knowledge about the adverse effects of excessive noise on the public health, the general welfare, and property, and that this knowledge should be used to develop environmental noise standards that will protect the public health, the general welfare, and property with an adequate margin of safety; and
(3) That it is essential to have coordination and statewide leadership of the noise control activities of the many State agencies and the county and local governments.
(b) It is the intent of the General Assembly that the Department shall:
(1) Seek appropriate resources to ensure enforcement of the sound level limits and noise control rules and regulations adopted under this title; and
(2) Work cooperatively with the appropriate agencies of political subdivisions in ensuring the implementation and enforcement of the requirements of this title.

§ 3-103. Responsibilities of the Department

(a) Except as otherwise provided by law, and in addition to the duties set forth elsewhere in this title, the Department shall:
(1) Develop a plan for attaining and maintaining the environmental noise standards that are adopted;
(2) Coordinate all State agency programs on noise control; and
(3) Keep a record of each sound level limit that is adopted by any political subdivision or agency of this State.
(b) Each State agency shall consult with the Department before adopting any sound level limit or noise control rule or regulation.

Insertion - ALL CAPS.
Deletions - strike-out

§ 3-104. Authority to Obtain Funds
The Department may obtain any federal or other funds that are available to this State for purposes that are within the scope of this title

§ 3-105. Powers and Duties of Political Subdivisions
(a) (1) Except as provided in this section, this title does not limit the power of a political subdivision to adopt noise control ordinances, rules, or regulations.
(2) A political subdivision may not adopt any noise control ordinance, rule, or regulation that is less stringent than the environmental noise standards, sound level limits, and noise control rules and regulations adopted under this title.
(3) (i) A political subdivision may not adopt any noise control ordinance, rule, or regulation, including the environmental noise standards, sound level limits, and noise control rules and regulations adopted under this title, that prohibits trapshooting, skeetshooting, or other target shooting between the hours of 9 a.m. and 10 p.m. by a shooting sports club that is chartered and in operation as of JANUARY 1, 2001. ~~July 1, 1983. However, this prohibition does not apply if the sports shooting club moves to a parcel of land that is not contiguous to the location of the club on July 1, 1983.~~
(THE ABOVE CHANGE WAS ENACTED UNDER SB 869/ HB 1423 IN 2001)

(ii) This paragraph does not apply in Allegany, Baltimore City, Calvert, Charles, Garrett, Howard, Montgomery, St. Mary's, and Washington counties.
(b) Each political subdivision:
(1) SHALL send to the Department a copy of each noise control ordinance, rule, or regulation that it adopts;
(2) SHALL identify on each zoning map, comprehensive plan, or other appropriate document the sound level limits that are adopted under Subtitle 4 of this title, AND
(3) IS ENCOURAGED TO CONSIDER:
(I) COMPLIANCE WITH STATE OR LOCAL NOISE STANDARDS BEFORE ACTING ON ANY PROPOSED VARIANCE REQUESTS OR CHANGES IN ZONING CLASSIFICATIONS; AND
(II) WHETHER THE PERMIT OR ACTIVITY WILL BE IN COMPLIANCE WITH LOCAL AND STATE NOISE CONTROL STANDARDS, PRIOR TO THE ISSUANCE OF A BUILDING, ACTIVITY PERMIT, OR SIMILAR AUTHORIZING DOCUMENT.

Subtitle 2. Environmental Noise Advisory Council
§ 3-201. Council Established
There is an Environmental Noise Advisory Council in the Department.

§ 3-202. Membership
(a) (1) The Council consists of 11 members appointed by the Secretary.
(2) Of the 11 Council members:
(I) 9 VOTING MEMBERS appointed by the Secretary; AND
(II) 2 EX OFFICIO MEMBERS.

(i) 1 shall be appointed from a list of at least 3 qualified individuals submitted to the Secretary by the Acoustical Society of America AND THE INSTITUTE OF NOISE CONTROL ENGINEERING;
(ii) 1 shall be a physician who specializes in hearing, appointed from a list of at least 3 qualified individuals submitted to the Secretary by the Medical and Chirurgical Faculty of the State of Maryland;
(iii) 1 shall be appointed from a list of at least 3 qualified individuals submitted to the Secretary by the Chancellor of the University System of Maryland;
(iv) 2 shall be appointed from the general public;
(V) 1 SHALL BE APPOINTED FROM A LIST OF AT LEAST 3 INDIVIDUALS SUBMITTED TO THE SECRETARY BY THE MARYLAND MUNICIPAL LEAGUE;
(VI) 1 SHALL BE APPOINTED FROM A LIST OF AT LEAST 3 INDIVIDUALS SUBMITTED TO THE SECRETARY BY THE MARYLAND ASSOCIATION OF COUNTIES;
(VII) 2 SHALL BE APPOINTED FROM A LIST OF AT LEAST 3 INDIVIDUALS SUBMITTED TO THE SECRETARY BY THE MARYLAND CHAMBER OF COMMERCE;
(IX) 1 EX OFFICIO MEMBER SHALL BE A MEMBER OF THE SENATE OF MARYLAND, APPOINTED BY THE PRESIDENT OF THE SENATE; AND
(X) 1 EX OFFICIO MEMBER SHALL BE A MEMBER OF THE HOUSE OF DELEGATES, APPOINTED BY THE SPEAKER OF THE HOUSE.

(3) In making any appointment to the Council, the Secretary shall consider giving appropriate representation to the various geographical areas of this State.
(b) Each member of the Council shall be a resident of this State.
(c) (1) The term of a member is 5 years.
(2) At the end of a term, a member continues to serve until a successor is appointed and qualifies.
(3) A member who is appointed after a term has begun serves only for the rest of the term and until a successor is appointed and qualifies.

§ 3-203. Officers
From among the Council members, the Secretary of the Environment shall appoint a chairman, a vice chairman, and a secretary of the Council.

§ 3-204. Meetings; compensation; staff
(a) The Council shall meet at the times and places that the Secretary or the chairman determines.
(b) A member of the Council:
(1) May not receive compensation; but
(2) Is entitled to reimbursement for expenses under the Standard State Travel Regulations, as provided in the State budget.
(c) The Department shall provide the Council with secretarial and stenographic assistance

§ 3-205. Advisory Role of Council
(a) Before the Department PROPOSES any CHANGES IN THE PROVISIONS OF THIS TITLE OR REVISIONS TO THE environmental noise REGULATIONS, the Department shall

(1) submit the proposed REVISIONS to the Council for advice.
(2) CONDUCT PUBLIC HEARINGS; AND
(3) PREPARE OR SOLICIT TECHNICAL INPUT ON ISSUES RELATED TO THE REVISIONS.

(b) Within 60 days after receiving a proposed environmental noise standard or sound level limit from the Department, the Council shall give the Department its advice on the proposal by recommending:
(1) Adoption;
(2) Rejection; or
(3) Modification

(C) THE COUNCIL MAY PROVIDE ADVICE TO THE DEPARTMENT ON ANY MATTER RELATING TO NOISE POLLUTION.

SECTION 2. AND BE IT FURTHER ENACTED, That the terms of the voting members of the Environmental Noise Advisory Council shall expire as follows:
(1) 2 members in 2004;
(2) 2 members in 2005;
(3) 2 members in 2006; and
(4) 3 members in 2007.

Subtitle 3. Interagency Noise Control Committee
§ 3-301. Committee Established
There is an Interagency Noise Control Committee.

§ 3-302. Composition; chairman
(a) The Committee consists of:
(1) 1 member of the Governor's executive staff, appointed by the Governor; and
(2) 1 representative of each of the following departments, appointed by the Secretary of that department:
(i) The Department of the Environment;
(ii) The State Department of Transportation;
(iii) The Department of Natural Resources;
(iv) The Department of Planning;
(V) THE DEPARTMENT OF HEALTH AND MENTAL HYGIENE;
(VI) THE DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT;
(VII) THE DEPARTMENT OF LABOR, LICENSING, AND REGULATION; and
(v) Any other principal department that develops, adopts, or enforces any noise control rule or regulation.
(b) The member who is appointed by the Secretary of the Environment is chairman of the Committee.

§ 3-303. Meetings; compensation; staff
(a) The Committee shall meet at least twice a year, at the times and places that it determines.
(b) A member of the Committee:

(1) May not receive compensation; but
(2) Is entitled to reimbursement for expenses under the Standard State Travel Regulations, as provided in the State budget.
(c) (1) In accordance with the State budget, the Committee may:
(i) Employ a staff;
(ii) Employ consultants; and
(iii) Obtain office facilities.
(2) The Department of the Environment shall provide the Committee with secretarial and stenographic assistance.

§ 3-304. Duties of the Committee
(a) The Committee shall:
(1) Receive reports of progress, problems, and proposed plans for attaining and maintaining State environmental noise standards from each agency that is represented on the Committee;
(2) Evaluate the adequacy of existing and proposed efforts to attain and maintain State environmental noise standards;
(3) Review the relationship of State noise control rules and regulations with other environmental laws, rules, regulations, standards, and programs; and
(4) Recommend new or revised noise control rules, regulations, or legislation.
(b) If the Council requests, the annual report of the Committee shall include a report of the Council.

Subtitle 4. Rulemaking and Enforcement
§ 3-401. Environmental noise standards, sound level limits, and noise control rules and regulations - Adoption
(a) Except as otherwise provided by law, the Department shall adopt environmental noise standards, sound level limits, and noise control rules and regulations as necessary to protect the public health, the general welfare, and property.
(b) In adopting environmental noise standards, the Department shall consider:
(1) Information published by the Administrator of the United States Environmental Protection Agency on the levels of environmental noise that must be attained and maintained in defined areas under various conditions to protect public health and welfare with an adequate margin of safety; and
(2) Scientific information about the volume, frequency, duration, and other characteristics of noise that may harm public health, safety, or general welfare, including:
(i) Temporary or permanent hearing loss;
(ii) Interference with sleep, speech communication, work, or other human activities;
(iii) Adverse physiological responses;
(iv) Psychological distress;
(v) Harm to animal life;
(vi) Devaluation of or damage to property; and
(vii) Unreasonable interference with the enjoyment of life or property.
(c) (1) In adopting sound level limits and noise control rules and regulations, the Department shall consider, among other things:
(i) The residential, commercial, or industrial nature of the area affected;
(ii) Zoning;

(iii) The nature and source of various kinds of noise;
(iv) The degree of noise reduction that may be attained and maintained using the best available technology;
(v) Accepted scientific and professional methods for measurement of sound levels; and
(vi) The cost of compliance with the sound level limits.
(2) The sound level limits adopted under this subsection shall be consistent with the environmental noise standards adopted by the Department.
(3) The sound level limits and noise control rules and regulations adopted under this subsection may not prohibit trapshooting or other target shooting on any range or other property in Frederick County that the Frederick County Department of Planning and Zoning has approved as a place for those sporting events.
(4) The sound level limits and noise control rules and regulations adopted under this subsection shall be as follows for residential heat pumps and air conditioning units:
(i) Residential heat pumps 75dba.
(ii) Residential air conditioning units 70dba.

(5) (i) The sound level limits and noise control rules and regulations adopted under this subsection may not prohibit trapshooting, skeetshooting, or other target shooting between the hours of 9 a.m. and 10 p.m. on any range or other property of a shooting sports club that is chartered and in operation as of JANUARY 1, 2001. ~~July 1, 1983. However, this prohibition does not apply if the sports shooting club moves to a parcel of land that is not contiguous to the location of the club on July 1, 1983.~~
(THE ABOVE CHANGE WAS ENACTED UNDER SB 869/ HB 1423 IN 2001)

(ii) This paragraph does not apply in Allegany, Anne Arundel, Baltimore City, Calvert, Charles, Garrett, Howard, Montgomery, St. Mary's, and Washington counties.
(d) (1) This section does not authorize the Department to adopt environmental noise standards, sound level limits, or noise control rules and regulations that apply to noise from:
(i) Construction or repair work on public property; or
(ii) Fire or rescue station alerting devices.
(2) Noise control rules and regulations that apply to Department of Transportation facilities shall be adopted jointly by the Department of Transportation and the Department of the Environment.

§ 3-402. Same – Procedures for Adoption
(a) The Department may not adopt any environmental noise standard, sound level limit, or noise control rule or regulation unless the requirements of this section and the Administrative Procedure Act are met.
(b) Before adopting any proposed environmental noise standard, sound level limit, or noise control rule or regulation, the Department shall announce and hold a public hearing on the subject.
(c) (1) At least 60 days before the public hearing, the Department shall publish notice of the hearing in a newspaper of general circulation within the area concerned.
(2) The notice shall state:
(i) The date, time, and place of the hearing; and
(ii) The purpose of the hearing.

(d) At least 60 days before the public hearing, the Department shall make the proposed environmental noise standard, sound level limit, or noise control rule or regulation available to the public.
(e) After the public hearing, the Department may adopt the proposed environmental noise standard, sound level limit, or noise control rule or regulation, with or without modification.

§ 3-403. Same - Enforcement
(a) The Department shall enforce the sound level limits and noise control rules and regulations adopted under this title.
(b) To the maximum extent possible, the Department shall use the facilities and services of appropriate agencies of political subdivisions in its enforcement under this section.
(c) The Department may assist the noise control efforts of any appropriate agency of any political subdivision by giving that agency technical assistance in the form of personnel or equipment.
(d) Each sound level limit shall be applied at the boundary of:
(1) A property; or
(2) A land use category, as determined by the Department.

§ 3-404. Corrective Orders
If the Department determines that there is a violation of this title or any sound level limit or noise control rule or regulation adopted under this title, the Department, after notice to the alleged violator, may issue a corrective order.

§ 3-405. Injunctive actions
(a) The Department may bring an action to enjoin any conduct that is a willful violation of any provision of this title or any rule, regulation, or order adopted or issued under this title.
(b) An action may not be brought under this section unless the person against whom it is brought has been given a reasonable time to comply with the provision that is the basis of the action.

§ 3-406. Civil Penalty
(a) A person who willfully violates any provision of this title or any rule, regulation, or order adopted or issued under this title is liable to a civil penalty not exceeding $10,000, to be collected in a civil action brought by the Department in the circuit court for any county. Each day a violation continues is a separate violation under this section.
(b) If the Attorney General concurs, the Secretary may compromise and settle any claim for a civil penalty under this section.
(c) If, within 1 year after a civil penalty is compromised and settled under subsection (b) of this section, the person against whom the penalty is imposed satisfies the Secretary that the violation has been eliminated or the order has been satisfied, the Secretary, with the concurrence of the Attorney General, may return to the person not more than 75 percent of the penalty paid.
(d) An action under this section is in addition to and not instead of an action for injunctive relief under § 3-405 of this subtitle.

§ 3-407. Plan for Compliance

(a) A person is not subject to action for a violation of a provision of this title or any rule or regulation adopted under this title so long as the person acts in accordance with a plan for compliance that:
(1) The person has submitted to the Secretary; and
(2) The Secretary has approved, with or without amendments.
(b) The Secretary shall act on any plan for compliance within 90 days after the plan is submitted to the Secretary.

§ 3-408. Conditions not violations
A condition that is caused by an act of God, a strike, a riot, a catastrophe, or a cause over which an alleged violator has no control is not a violation of this title or any rule or regulation adopted under this title.

Except as otherwise noted, the changes in BOLD were enacted under HB 174 (2003).

DECIDING WHETHER TO MOVE INTO A NOISY NEIGHBORHOOD

Acoustical engineers and scientists have been working for decades to develop complex computer programs for making noise contour maps around noisy facilities, such as highways, airports, power plants, railroads and military bases. These maps are intended to guide prospective residents in deciding whether to rent or buy a dwelling unit in a particular area. Even in neighborhoods not covered by noise contour maps, around-the-clock sound exposures[1] can be measured with instruments costing as little as $1,000. In short, prospective residents have the opportunity to know a lot about neighborhood noise before they decide to move into a neighborhood.

Within the U.S., it is accepted practice to interpret noise contour maps in terms of the percentage of people who would describe themselves as "highly annoyed" by the noise in their neighborhood. For example, a day-night sound level (DNL) of 65 decibels (dB) is considered "normally incompatible" with residential use. At a DNL of 65 dB, twelve percent of the population is expected to describe their self as "very" or "extremely" annoyed.[2] The other 88% is expected to describe their self as "moderately", "slightly" or "not at all" annoyed. This scatter around the average makes it very difficult to predict how an individual resident will experience a noisy neighborhood. As a widely-respected Australian noise expert, Dr. Jobs, described the problem, "... only a small percentage (typically less than 20%) of the variation in individual reaction is accounted for by noise exposure."[3]

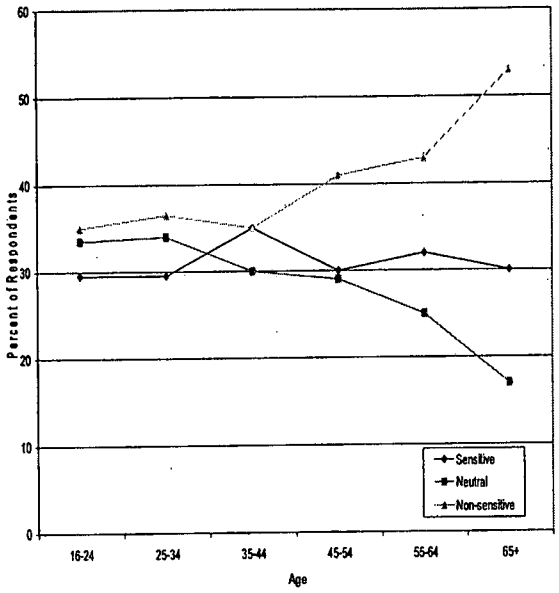
In looking at the difficulty in predicting individual reaction, experts have come up with the term "situational and personal variables." A respected U.S. noise scientist, Dr Fields, studied social surveys of noisy neighborhoods around the world and concluded that "Annoyance is related to the amount of isolation from sound at home and to five attitudes."[4] These attitudes are:

- Fear of danger from the noise source,
- Noise prevention beliefs,
- General noise sensitivity
- Beliefs about the importance of the noise source, and
- Annoyance with non-noise impacts of the noise source."

Acoustic isolation in the home has been addressed in the USEPA's 1978 publication, Quieting in the Home. People moving into a noisy neighborhood can use that publication to study whether their prospective home is designed to reduce the amount of noise coming through windows, walls and roof. As to the five attitudes, some can be modified by experience, but "noise sensitivity" does not appear to be modifiable. You are either noise sensitive (NS) or non-noise sensitive (NNS). The purpose of the following discussion is to assist you in deciding whether you are NS or NNS.

In a 1999 review of different field surveys of response to transportation noise, the incidence of NS among a sample of 15,171 people was 22%[5], so it seems safe to guess that at least one out of five people are NS. In this review, 46% had "low sensitivity" and 32% had "medium sensitivity." An English study in which the incidence of NS was somewhat higher showed that the incidence of NS is stable across age groups[6]. As shown in Figure 1, about 30%of young people (16-24 years) knew they were NS, 35% knew they were NNS, and about 34% were neutral. For people ages 65 and older, only 17% were neutral

Figure 1. Noise Sensitivity Related to Age



Several physiologists and psychologists have studied the NS and found few differences between groups. At traffic noise levels higher than would be found in a normal neighborhood [85 dB, A-weighted], NS men showed significantly larger increases in heart rate, systolic and diastolic blood pressure than NNS men.[7] At noise levels more typical of real neighborhoods, however, the cardiovascular differences between NS and NSS subjects were negligible[8]. NS individuals do not hear any better than the NNS.[9] Their reaction time to loud sounds is no different than the reaction time of the NNS. The NS doesn't experience a loud sound as any louder than a NNS. When listening to helicopter noise at loud levels (80 dB maximum), the blood pressure of NS subjects is no higher than the BP of NNS.[10] In short, common physiological measures cannot be used to identify the NS person.

The fact that noise sensitivity is a subjective experience does not make it any less real. A test designed to measure NS, Weinstein's Noise Sensitivity Scale, has been in use since 1978,[11] and other researchers have found this test to be quite satisfactory with regards to reliability, internal consistency, factor structure and construct validity.[12] Weinstein's original questions are listed in Table 1. In Weinstein's original work, the

average score for NS was 67.9 and the average score for NNS was 39.8. Weinstein's scale is designed to capture sensitivity to different noise sources. This design is consistent with research showing that people who are more annoyed than the general population by one source of noise will also be more annoyed by another source of noise.[13]

Table 1
Items on the Original Weinstein Noise Sensitivity Scale

1. I wouldn't mind living on a noisy street if the apartment I had was nice.
2. I am more aware of noise than I used to be[a].
3. No one should mind much if someone turns up his stereo full blast once in a while.
4. At movies, whispering and crinkling candy wrappers disturb me.[a]
5. I am easily awakened by noise.[a]
6. If it's noisy where I'm studying, I try to close the door or window or move someplace else.[a]
7. I get annoyed when my neighbors are noisy.[a]
8. I get used to most noises without much difficulty.
9. How much would it matter to you if an apartment you were interested in renting was located across from a fire station.[a]
10. Sometimes noises get on my nerves and get me irritated.[a]
11. Even music I normally like will bother me if I'm trying to concentrate.[a]
12. It wouldn't bother me to hear the sounds of everyday living from my neighbors (footsteps, running water, etc).
13. When I want to be alone, it disturbs me to hear outside noises.[a]
14. I'm good at concentrating no matter what is going on around me.
15. In a library, I don't mind if people carry on a conversation if they do it quietly.
16. There are often times when I want complete silence.[a]
17. Motorcycles ought to be required to have bigger mufflers.[a]
18. I find it hard to relax in a place that's noisy.[a]
19. I get mad at people who make noise that keeps me from falling asleep or getting work done.[a]
20. I wouldn't mind living in an apartment with thin walls.
21. I am sensitive to noise.[a]

NOTE: Most items are presented on a 6-point scale ranging from agree strongly (1) to disagree strongly (6).
[a]Items scored in opposite direction before responses are summed.

Several studies have looked at the behavior and personality of people describing themselves as NS. The English authors of one of the earliest of these studies[14] wrote in 1972:

> *"The most outstanding impression of those people who were noise sensitive was that they were typically friendly, generous and sociable and very much aware of their environment. As is well known about those who complain of noise they were equally liable to complain about other defects in their neighborhood, e.g. the drains, etc. On the positive side they were frequently active in the community, e.g. in voluntary social work and very much aware of the needs of others. Very often they were 'creative', having some hobby such as painting or writing. Usually they seemed to be of above-average intelligence compared with their neighbors."*

The authors of a study of 3,445 persons exposed to noise in Amsterdam reported that NS appears to be more strongly represented among persons with a higher socio-economic status.[15]

Another way of looking at the NS is that they have a very active "orienting response" (OR). The OR is sometimes called the orienting reflex. It was first recognized and reported by the famous Russian physiologist Sechenov in the 1850s in his book Reflexes of the Brain. Pavlov (of salivating dogs fame) referred to the OR as the "What is it?" reflex. In the 1950's, a third Russian physiologist, Sokolov, documented how this distinctive pattern of changes in respiration, heart, skin conductance, eyes and ears gradually decreases when a novel sight or sound is repeated. For our ancestral hunter-gatherers living in natural quiet, an active OR was essential for survival. It helped the hunter keep food on the table and the gatherer to avoid predators. However, in a world filled with roars, buzzes and bangs, an active OR can be a disadvantage, especially for people whose nervous systems have difficulty "turning off" the OR.

The process of "turning off" the OR is called "habituation," and NS subjects have a harder time habituating to a repeated sound than NNS subjects. For example, an English study compared changes in skin conductance when NS and NNS women listened to sounds at 50, 75 and 100 dB, A-weighted. The NS women were more reactive to the first presentation of the sound and they were slower to habituate when the sounds were repeated.[16]

The OR prepares our sensory system to take in new information, but if the OR is over active, the NS individual can be distracted from focusing on other important information. So, the NS person may complain, "I can't concentrate with all this noise," whereas that person's NNS spouse may be completely unperturbed. Such distractibility is documented in another study of English women. Women experiencing a relatively high and a relatively low exposure to aircraft noise completed a twenty-question "Everyday Errors Questionnaire"[17] An example of one of these "everyday error questions" was "*Do you start doing one thing at home and get distracted into doing*

something else (unintentionally)?" The NS women reported more everyday errors in both the low and high aircraft noise exposure neighborhoods.

The NS individual doesn't stop being vigilant when she sleeps. The difference in sleep quality between the NS and NNS is not as large at relatively high noise exposures as at relatively low exposures. This tendency was documented in a Swedish study of sleep disturbance from traffic noise. When NS and NNS slept in a 60 dB, A-weighted, environment, the differences in sleep quality between the two groups in sleep quality were not as pronounced as when both groups slept in a 50 dB,A-weighted, environment.[18]

The tendency for the NS to be more disturbed by moderately loud sounds than the NNS is also reflected in judgments of subjective annoyance or unpleasantness. When listening to a clearly aversive sound (jackhammer), the NS rates the unpleasantness of the sound in the same way as the NNS. However, for somewhat less aversive sounds (vent, mower, brake, truck, crash, train), the NS gives a higher unpleasantness rating than does the NNS.[19] In a study of 2,933 residents of Greater London exposed to traffic noise, the NS reported being more annoyed than the NNS at relatively low exposures, but converged with the NSS as the intensity of exposure increased.[20] A similar phenomenon has been observed in the laboratory.[21]

The most controversial research concerning the NS population is about psychiatric symptoms. A Norwegian study found NS to be predictive of depression among men.[22] An English study found NS women exposed to aircraft noise to have a greater incidence of phobic disorders and depression.[23] A Japanese study reported similar findings.[24] An association between NS and "neuroticism" has been reported from England,[25] Sweden,[26] and Serbia.[27] If translated into a typical 21st Century "sound byte", the statistical connection between NS and neuroticism could be used to isolate and ignore the NS population. To call someone "neurotic" is pejorative in American society. Managers of noisy facilities, such as airports, industrial operations and military installations, receive most of their noise complaints from a few people. Labeling those few people "neurotic" could trivialize legitimate public concerns. If one looks at the actual details of these studies, this statistical association is seen as quite complex.

First, neurotic and *neuroticism* are not the same words. Neurotic is a vague term used widely in every day conversation to suggest that someone is too nervous or unstable. Neuroticism is a construct derived from a statistical procedure known as *factor analysis*. This statistical procedure allows psychologists to look at the interconnections between answers to a set of questions and find "clumps" of answers that are statistically interrelated. The *neuroticism scale* is one of five important dimensions describing the ways in which different personalities differ. The other scales are *openness*, *conscientiousness*, *extraversion*, and *agreeableness*. When people answer questions about their personality, the answers tend to segregate along these five dimensions.

Second, questions designed to measure neuroticism and NS are both measuring negative affectivity. People who are more bothered by noise in their neighborhood than their neighbors can be expected to experience negative affectivity. If these NS

individuals were transported to a completely quiet environment, the negative affectivity might disappear, but they would still remain NS.

In 1992, Dr. Stephen Stansfeld, an English psychiatrist who has written more about this subject than anyone else, provided the following summary:

> *In summary, noise sensitivity may be comprised of two elements. Noise is important to noise-sensitive people who attend to noises more, discriminate between noises more, and tend to find noises more threatening and out of their control than people who are not sensitive to noise. Secondly, because of negative affectivity, they react to noises more than less sensitive people, and may adapt to noises more slowly. This may result in a greater expression of annoyance to noises than in less sensitive people, both because this is a response to greater threat and also because they may have a general tendency to be annoyed, irrespective of noise. Both these latter factors may be active in explaining the association between noise-sensitivity and current psychiatric disorder and explaining why noise sensitivity is a vulnerability factor for psychiatric disorder.*[28]

CAVEAT EMPTOR.....

If you have read through this discussion, you should have a fairly good idea whether you or someone in your family is NS. As suggested by the data in Figure 1, the older you are, the more likely you will know whether you are NS. Also, the questions in the Weinstein Noise Sensitivity Scale should be informative. The goal of this discussion has been to assist you in becoming a more informed consumer of prospective neighborhoods. Within the U.S., the regulation of neighborhood noise levels is relatively weak when compared with European countries, but several U.S. States include noise levels in real estate disclosure laws.

In Australia, the Commonwealth Department of Transport and Regional Services has considered the research on NS and developed a new approach to describing noise in neighborhoods over flown by aircraft.[29] Rather than simply provide an average exposure level as in the U.S, the Australian officials are publishing maps showing the number of times aircraft are likely to be heard in the neighborhood and other data. Australian officials believe that this new approach allows the NS to make a more informed decision about whether to move into a particular neighborhood. The Australian initiative has been discussed by the U.S. Federal Interagency Committee on Aviation Noise, but as of 2003, Federal agencies were not anticipating any changes in the way noise is described within the U.S. So, in the meantime, it is up to the buyer to learn about neighborhood noise. ***Caveat emptor***!

Acknowledgement: This discussion was prepared by Dr. George A. Luz, the former Program Manager for Environmental Noise at the U.S. Army Center for Health Promotion and Preventive Medicine, Aberdeen Proving Ground, MD.

REFERENCES

[1] The US Environmental Protection Agency has recommended the use of a 24 hour measure, the day-night average sound level (DNL). The EPA's 1974 report explaining the advantages of DNL, Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, can be found on the Noise Pollution Clearinghouse website, http://www.nonoise.org

[2] L.S. Finegold, C.S. Harris and H.E. von Gierke, "Community annoyance and sleep disturbance: Updated criteria for assessing the impacts of general transportation noise on people," **Noise Control Engineering Journal**, Vol 42(1), 1994, 25-30

[3] R.F.S. Job, "Community response to noise: A review of factors influencing the relationship between noise exposure and reaction," **Journal of the Acoustical Society of America**, Vol. 83(3), March 1988, 991-1001

[4] J. M. Fields, "Effect of personal and situational variables on noise annoyance in residential areas," **Journal of the Acoustical Society of America**, Vol. 93(5), May 1993, 2753-2763

[5] H.M.E. Miedema and H. Vos, Demographic and attitudinal factors that modify annoyance from transportation noise," **Journal of the Acoustical Society of America,**, Vol. 105 (6), 1993, 3336-3344

[6] F.J. Langdon, "Noise nuisance caused by road traffic in residential areas: Part III," **Journal of Sound and Vibration**, Vol 49(2), 1976, 241-256

[7] H. Ising, D. Dienel, T. Guenther and B. Markert, "Health effects of traffic noise," **Int. Archives of Occupational and Environmental Health**, Vol. 47, 1980, 179-190

[8] B. Griefahn and J. Di Nisi, "Mood and cardiovascular functions during noise, related to sensitivity, type of noise and sound pressure level," ," **Journal of Sound and Vibration**, Vol 155(1), 1992, 111-123

[9] W. Ellermeier, M. Eigenstetter and K. Zimmer, "Psychoacoustic correlates of individual noise sensitivity," **Journal of the Acoustical Society of America**, Vol. 109(4), 2001, 1464-1473

[10] A.P. Smith and N. Rich, "Helicopter noise, noise sensitivity, annoyance and cardiovascular response," Paper given at 2002 International Congress and Exposition on Noise Control Engineering, **Inter-noise 2002**, Dearborn, MI, August 19-21, 2002

[11] N.D. Weinstein, "Individual differences in reaction to noise: a longitudinal study in a college dormitory: **Journal of Applied Psychology**, Vol 63, 1978, 458-466

[12] B. Ekehammar and S. Dornic, "Weinstein's Noise Sensitivity Scale: Reliability and construct validity," **Perceptual and Motor Skills**, Vol 70, 1990, 129-130

[13] Job, R.F.S., J. Hatfield, N.L Carter, P. Peploe, R. Taylor and S. Morrell, "Reaction to combined noise sources: The roles of general and specific noise sensitivities," Paper given at Inter-noise 99, Fort Lauderdale, FL, December 6-8, 1999, pp. 1189-1194; also see Meijer et al., op. cit.

[14] N.M. Moreira and M.E. Bryan, "Noise annoyance susceptibility," **Journal of Sound and Vibration** Vol 21(4), 1972, 449-462

[15] H. Meijer, P. Knipschild, and H. Salle, "Road traffic noise annoyance in Amsterdam," **Int. Archives of Occupational and Environmental Health**, Vol 56, 1985, 285-297

[16] S. Stansfeld, "Noise, noise sensitivity and psychiatric disorder: epidemiological and psychophysiological studies, **Psychological Medicine**, Monograph Supplement 22, 1992
1-44

[17] A. Smith and S. Stansfeld, "Aircraft noise exposure, noise sensitivity, and everyday errors," **Environment and Behavior**, Vol 18(2), 1986, 214-226

[18] E. Öhrström and R. Rylander, "Sleep disturbance by road traffic noise – A laboratory study on number of noise events, **Journal of Sound and Vibration,**, Vol 143(1), 1990, 93-101

[19] Ellermeier et al., op.cit.

[20] F.J. Langdon, "Noise nuisance caused by road traffic in residential areas: Part II," **Journal of Sound and Vibration**, Vol 47(2), 1976, 265-282

[21] N.M. Moreira and M.E. Bryan, "Noise annoyance susceptibility," **Journal of Sound and Vibration**, Vol 21(4), 1972, 449-462

[22] Nyström, S. and B. Lindgård, "Depression: Predisposing Factors," **Acta Psychiatrica Scandinavia** Vol 51, 1975, 77-87

[23] Stansfeld, S.A., C.R. Clark, I.M. Jenkins, and A. Tarnopolsky, "Sensitivity to noise in a community noise sample: I. The measurement of psychiatric disorder and personality," **Psychological Medicine** Vol. 15, 1985, 243-254

[24] Iwata, O., "The relationship of noise sensitivity to health and personality," **Japanese Psychological Research**, Vol 26, 1984, 217-220

[25]Stansfeld et al., 1985, op. cit.

[26] Öhrström, E. M. Bjorkman and R. Rylander, "Noise annoyance with regard to neurophysiological sensitivity, subjective noise sensitivity and personality variables," **Psychological Medicine** Vol. 18, 1988, 605-611

[27] G. Belojevic and B. Jakovljevic, "Factors influencing subjective noise sensitivity in an urban population," **Noise and Health**, Vol 4, 2001, 17-24

[28] Stansfeld, 1992, op. cit.

[29] D. Southgate, "Using 'real' aircraft noise information to assist the noise sensitive individual," Paper given at **Inter-noise 2000**, The 29th International Congress and Exhibition on Noise Control Engineering, 27-30 August 2000, Nice, France

Summary of Issues Under Consideration by the Department For Review by the Environmental Noise Advisory Council and the Interagency Noise Control Committee June 21, 2002 – Revised Dec 2003

Issue	Summary	Requires Statute Change	Requires Regulatory Change	Proposed Language
Continuous Noise (goal versus standards)	The longstanding **goal** in the regulations suggests that an L_{dn} of 55 dBA should be achieved. The existing language and structure of the regulations is open for consideration for changing the 55 L_{dn} goal to a standard. This would be of concern to power plants, institutional HVAC systems, and other sources that operate 24 hours per day that have been regulated solely under the noise maximum standards.	Yes	Yes **No Action**	
Impulse Noise Definition (incomplete definition)	Regulations define periodic noise as having a "repetitive on-and-off characteristic" and in the standards section reduce allowable noises with these characteristics by 5 dB. A revision of the definition to specify that these noises must have a cyclical duration of less than 2 seconds is an option to conform with generally recognized acoustical terminology and provide clear guidance for compliance determinations.	No	Yes **Regulations being modified fall 2003**	Regulation – 26.02.03.01 – Definitions P. "Periodic **AND IMPULSE** noise" means noise possessing AN ~~a repetitive~~ on-and-off characteristic **WITH A RAPID RISE TO PEAK AND A SHORT DECAY NOT EXCEEDING 2 SECONDS.**
Measurement Technique (integration period needs to be defined)	Fast L_{max} has generally been used by the Department as the measurement for obtaining maximum noise readings. Old analog meters were used with operator subjectivity. Digital meters now in use allow for the integration of sound levels over as little as $1/x^{th}$ of a second for these measurements. Current regulations are silent in this regard. Should another averaging period be used to determine maximum sound levels?	No	Yes **No action**	
Agricultural Equipment Definitions	Regulations have exempted agricultural field equipment since they were established in the 1970s. The language was, however silent on non-field equipment. MDE has enforced noise standards on fixed location farm equipment throughout the program history and clarifying definitions in the regulations to clearly indicate that fixed location equipment is regulated is an option.	No	Yes **No action**	Regulation – 26.02.03.01 – Definitions ---- **(Z) MOBILE AGRICULTURAL FIELD EQUIPMENT – MEANS FIELD EQUIPMENT WITH A PRIMARY FUNCTION IS ACCOMPLISHED WHILE IN MOTION, INLCUDING BUT NOT LIMITED TO TRACTORS, TRUCKS, WAGONS, SPREADERS, AND COMBINES.** **(AA) STATIONARY AGRICULTURAL FIELD**

				MACHINERY – MEANS EQUIPMENT THAT IS USED PRIMARILY AT A FIXED LOCATION FOR EXTENDED PERIODS OF TIME. THIS EQUIPMENT WOULD INCLUDE BUT NOT BE LIMITED TO PUMPS, GENERATORS, CHILLERS, AND GRAIN DRYING EQUIPMENT. Regulation 26.02.03.03 B – Exemptions **(c) SOUND FROM MOBILE** agricultural field machinery when used and maintained in accordance with the manufacturer's specifications.
Household Tools (nighttime restrictions)	These items have been totally exempted from the regulations. Several complaints over the years involving unusual nighttime hobby hours by certain individuals suggest that the blanket exemption should be modified to exempt use of the equipment only during certain hours (e.g. 7 AM to 10 PM).	No	Yes **Regulations being modified fall 2003**	Regulation - 26.02.03 b (2) – Exemptions: (a) Household tools and portable appliances in normal usage **DURING DAYTIME HOURS.**
Residential HVAC (old standards – new equipment)	The longstanding partial exemption for residential AC equipment allowing maximum noise to 70 dBA and residential heat pumps to 75 dBA is over 25 years old. New equipment should allow these exemptions to be adjusted downward or eliminated. Grandfathering of existing equipment should be considered. Total removal from the statute is recommended and any continuance of exemptions could be handled solely through the regulations.	Yes Needed before the regulations can be considered for change. **No Action**	Yes **No action**	Statute - Subtitle 4. Rulemaking and Enforcement § 3-401. Environmental noise standards, sound level limits, and noise control rules and regulations - Adoption (c) (4) REPEAL AND RESERVE ~~[The sound level limits and noise control rules and regulations adopted under this subsection shall be as follows for residential heat pumps and air conditioning units:~~ ~~(i) Residential heat pumps 75dba.~~ ~~(ii) Residential air conditioning units 70dba.]~~ Regulation - 26.02.03 b (2) - Exemptions: Delete ~~[(m) Air conditioning or heat pump equipment used to cool or heat housing on residential property. For this equipment, a person may not cause or permit noise levels, which exceed 70 dBA for air conditioning equipment at receiving residential property and 75 dBA for heat pump equipment at receiving residential property.]~~
Household pets exemption (assign domestic issues to local animal control)	There are currently no exemptions for household pets or pets held in kennels. Therefore the State is assumed to have regulatory jurisdiction over even individual dog barking complaints. MDE is proposing that it regulate only pet noises associated with commercial operations (e.g. kennels) and thus place the burden of domestic dog barking complaints on local animal control programs.	No	Yes **Regulations being modified fall 2003**	Regulations - NEW 26.02.03 b (2) - Exemptions: **(N) HOUSEHOLD PETS AND ANIMAL SOUNDS EXCEPT WHEN IN CONNECTION WITH BOARDING/BREEDING FACILITIES, KENNELS, ANIMAL HOSPITALS AND SHELTERS.**

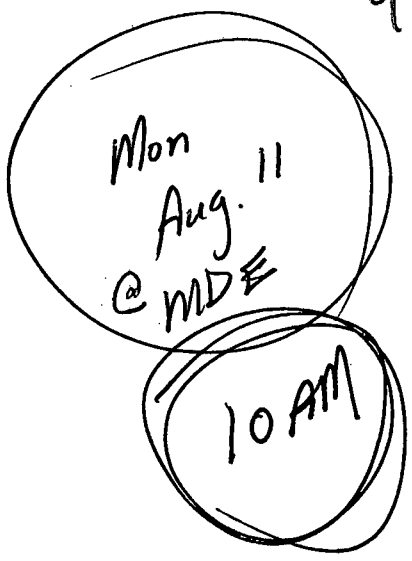
Public Property Exemption (should government be exempt?)	Open question – should the Department be allowed to impose standards on construction and repair work on public property? Should there be a distinction between routine and emergency work? Would this interfere with highway construction now be conducted at night?	Yes	No **No action**	
Variance Costs (should the applicant pay?)	The process for obtaining a variance includes the holding of a public hearing. This entails the identification of a suitable site and the hiring of a person to record the event and prepare an official record. The Department is also required to assign a person to serve as the hearing officer and prepare a decision document. An option could be to have the applicant, which now only pays for the newspaper notice, to assume all such costs. Estimated additional costs on the applicant range from $500 to $2000 depending on the length and complexity of the process.	No	Yes **Regulations being modified fall 2003**	
Auto Racing Exemption (Is the current exemption appropriate?)	Some facilities have been expanding their hours of operation and have, over time, included vehicles with louder engines and less muffling. Some citizens have requested some reduction in the hours of operation. Facilities have cited loss of competitiveness with similar facilities in adjacent jurisdictions and consistency with national racing organization standards. Options: 1- Remove the current exemption for auto racing facilities and fully regulate 2- Modify the current exemption to include limits on hours or days of operation 3- Impose requirement for mufflers for all vehicles or certain nights/hours. 4- Require variances or establish day and time limits for jet cars and other non competitive "show" vehicles. Leave current exemption as it is.	No	Yes **No action**	
Council Mission Statement (broaden review responsibilities)	Existing language seems to limit Council involvement in noise issues to a change in standards or limits. Previously approved and proposed language in HB 1421 would broaden the scope of the Council responsibilities to include the provision of advice "to the Department on any matter relating to noise pollution".	Yes **Statute modified – 2003 – HB 174**	No **Regulations being modified fall 2003**	

Council and Committee Membership (broader representation)	Should the membership of these two groups be altered as previously agreed upon, or should there be additional members as proposed in HB 1421?	Yes **Implemented in HB 174 - 2003**	No	
Local Government Roles (noise in permit and zoning review)	Local governments could enhance the prevention of noise problems through directed review of potential noise sources in permit and zoning processes.	Yes **Implemented in HB 174 - 2003**	No	**§ 3-105. Powers and Duties of Political Subdivisions** (b) Each political subdivision shall: (1) Send to the Department a copy of each noise control ordinance, rule, or regulation that it adopts; and (2) Identify on each zoning map, comprehensive plan, or other appropriate document the sound level limits that are adopted under Subtitle 4 of this title. (c) EACH POLITICAL SUBDIVISION IS ENCOURAGED TO CONSIDER: (1) COMPLIANCE WITH ANY STATE OR LOCAL NOISE STANDARDS IN ADVANCE OF ACTING ON ANY PROPOSED VARIANCE REQUESTS OR CHANGES IN ZONING CLASSIFICATIONS. (2) PRIOR TO THE ISSUANCE OF ANY BUILDING OR ACTIVITY PERMIT, OR SIMILAR AUTHORIZING DOCUMENT, IF THAT PERMIT OR ACTIVITY WILL BE IN COMPLIANCE WITH LOCAL AND STATE NOISE CONTROL STANDARDS
Dirt bikes/off road vehicles	Should the state or local jurisdictions impose an equipment or operational standards for off road vehicles to minimize the noise rather than rely on actual noise measurements? Balto. Co. reg. examined		**Regulations being modified fall 2003**	**Local or State:** Off road recreational vehicles shall not be operated on land parcels of less than 10 acres. Operation of off road recreational vehicles shall not be permitted on any land parcel unless the operational area is more than 500 feet from a residence and 500 feet from any livestock. **Link to State Motor Vehicle Law** No off road recreational vehicle may be sold in the State unless it is capable of meeting the highway noise standards established by the Motor Vehicle Administration – ref COMAR 11.14.07.04
Gun Clubs (bring regulations in line with the law)	A 1970s regulatory exempt for gun clubs was modified by 1983 legislation, which established requirements for some clubs in some counties. The regulations were never changed and need to be brought into conformity with the law. Proposed regulatory language would mirror the language in the statute.	No	Yes Approved Jan 2002 meeting **Regulations being modified fall 2003**	**Regulatory Changes** 26.02.03.03 B. Exemptions. (1) The provisions of this regulation may not apply to devices used solely for the purpose of warning, protecting, or alerting the public, or some segment thereof, of the existence of an emergency situation. (2) The provisions of this regulation do not apply to the following: (j) [~~Sound not electronically amplified created by sporting, amusement, and entertainment events and other public~~

				~~gatherings operating according to terms and conditions of the appropriate local jurisdictional body. This includes but is not limited to athletic contests, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. This exemption only applies between the hours of 7 a.m. and 12 midnight.]~~ SOUND, EXCEPT THOSE SOUNDS THAT ARE ELECTRONICALLY AMPLIFIED, CREATED BY SPORTING EVENTS (EXCEPT TRAP SHOOTING, SKEET SHOOTING, OR OTHE TARGET SHOOTING), ENTERTAINMENT EVENTS AND OTHER PUBLIC GATHERINGS OPERATING UNDER PERMIT OR PERMISSION OF THE APPROPRIATE LOCAL JURISDICTION. THIS INCLUDES BUT IS NOT LIMITED TO ATHLETIC CONTESTS, AMUSEMENT PARKS, CARNIVALS, FAIRGROUNDS, SANCTIONED AUTO RACING FACILITIES, PARADES, AND PUBLIC CELEBRATIONS. THIS EXEMPTION ONLY APPLIES BETWEEN THE HOURS OF 7 AM AND MIDNIGHT. (N) TRAP SHOOTING, SKEET SHOOTING, OR OTHER TARGET SHOOTING BETWEEN THE HOURS OF 9 AM AND 10 PM ON ANY RANGE OR OTHER PROPERTY OF A SHOOTING SPORTS CLUB THAT IS CHARTERED AND IN OPERATION AS OF JANUARY 1, 2001. THIS EXEMPTION DOES NOT APPLY IN ALLEGANY, ANNE ARUNDEL, BALTIMORE CITY, CALVERT, CHARLES, GARRETT, HOWARD, MONTGOMERY, ST. MARY'S AND WASHINGTON COUNTIES.
Low Frequency Noise	Bass octave bands are ignored in the "A" weighted measurements. Should there be a specific standard that considers these frequencies, especially as they apply to music that penetrates residential settings. This example, but might also apply to vehicle radios (these are however regulated by a 50-foot rule by MVA).		**No prior consideration**	

"new issue"

97



From: "George Harman" <gharman@mde.state.md.us>
To: <kpolcak@sha.state.md.us>
Date: 07/24/2003 5:16PM
Subject: Fwd: amy Lin itinerary

Ken,
I don't know much yet about this visit, but I think it would be good if you could be in attendance. I don't have a specific time yet, but this should be a two-hour meeting (either AM or PM). Since highway noise is as much of a concern here, it might be for Taiwan.

Are you interested? Are you available? If not, I would like a fresh set of outreach documents to provide when Dr. Lin visits.
George

>>> <Yang.Jentai@epamail.epa.gov> 07/23/03 05:00PM >>>
Stan: I am resending this because the address in the box was in error.
Amy: Can you send a simple bio or resume over?

Jentai Yang
==========
Jentai Yang, PhD. PE.
Office of International Affairs (OIA 2650R)
U.S. Environmental Protection Agency
1300 Pennsylvania Ave, Washington, DC 20004
Phone: (202) 564 6429 Fax: (202) 565 2412
Email: Yang.Jentai@EPA.gov
==========
----- Forwarded by Jentai Yang/DC/USEPA/US on 2003-07-23 16:58 -----

Jentai Yang/DC/USEPA/US@EPA 2003-07-23 16:55

To: Chiny@abag.ca.gov, jcwise@pacbell.net, Jentai Yang/DC/USEPA/US@EPA, Ken Feith/DC/USEPA/US@EPA, stsai@mde.state, Robert Mcgaughy/DC/USEPA/US@EPA, jcl@bnl.gov, BOslund@aol.com, Chein-Chi_Chang@dcwasa.com

cc:

Subject: amy Lin itinerary

All: Per our previous telephone conversation to some of you, Ms Amy Lin,
a senior environmental Specialist from Taiwan EPA will visit the US for
a study tour for Noise Control program sponsored by Ministry of

Economic
Affairs from 8/3/03 through 8/17/03. I have the honor to arrange her visit and am soliciting your assistance to arrange some local visit when
she travels to your area. Attached is her most recent itinerary and flight schedule. After you launch the attachment, you will find the document is in both Chinese and English. If you do not have a Chinese software, you should be able to figure out the content by reading the English portion of the program. Here is her planned stop at the three cities.

8/4 - 8/6 San Francisco
8/8 - 8/11 Washington-Baltimore
8/12 - 8/15 NYC.

Amy will write or contact you directly in the next few days. Since noise
control is no longer a Federal EPA program, I hope you can extend helping hands for her to visit some local offices concerning quiet community, transportation monitoring and whatever you think is good for
her to learn. Please call me anytime if you have any suggestions questions about her trip. Thank you.

(See attached file: ( )920715-1.doc)(See attached file: 920715.doc)
Jentai Yang
==========
Jentai Yang, PhD. PE.
Office of International Affairs (OIA 2650R)
U.S. Environmental Protection Agency
1300 Pennsylvania Ave, Washington, DC 20004
Phone: (202) 564 6429 Fax: (202) 565 2412
Email: Yang.Jentai@EPA.gov
==========
----- Forwarded by Jentai Yang/DC/USEPA/US on 2003-07-23 16:24 -----

Amy

<iclin@sun.epa.go v.tw> To: Jentai Yang/DC/USEPA/US@EPA, <jentaiyang@yahoo.com>

cc:

2003-07-18 02:55 Subject: amy's itinerary

Dear Dr.Yang:

My itinerary has been accepted by MOEA,
please help me to inform those who on the list,
one of my friend works in Taipei culture and Economic
center in New York is also on the list and I will connect
him by myself.

Thank you so much for your kind assistance.

The booking record is also on the attachment.

If you think it's proper for me to connect them by myself.
I will do that after you passed the message to them.

Thank you again and wish to see you soon!

Amy

Amy Lin

100 41 7
Tel:02-23117722 ext 2797
Fax:02-23810843
E-mail: iclin@sun.epa.gov.tw
iclin.epa@msa.hinet.net
Mobile:0925-290-080

(See attached file: ( )920715-1.doc)(See attached file: 920715.doc)

CC: "Dave Jarinko" <djarinko@mde.state.md.us>

100

照片
(photo)

聯合技術協助訓練計畫出國人員預定行程表（出國前）

TENTATIVE ITINERARY

出國人員中文姓名： 林怡君　　英文姓名：I-Chun Lin

PIO/P No.:484-C03-30317

服務機關中文名稱：行政院環境保護署　　英文名稱：Environmental Protection Administration

研習項目類別及中文名稱：環境音量監測實務及操作系統研習　　英文名稱：To study the environmental noise monitoring affairs and the operation system

預定出國期間：九十二年八月三日（日）至八月十七日（日）共計十五日

預定行程表如下（中英文並列）：

研習日期、時間 (Visiting Time)	研習地點 (Location)	擬研習機構及訪談對象 (Institutions & Persons to be visited)	研習機構聯絡人姓名、地址、電話、電傳號碼及 e-mail (Contact Person)	研習目的及討論主題（Topics for Discussion）
九十二年八月三日（日）	台北至舊金山 Taipei—	搭機赴美--行程	搭機赴美--行程	搭機赴美--行程

2003/8/3	San Francisco			
九十二年八月 四日（一） 2003/8/4	舊金山 San Francisco	朱麗安安德生博士, 美國環保署第九區 代局長 Julie Anderson , Deputy Director U.S. EPA Region 9,	朱麗安安德生博士,美國環保署 第九區 代局長 Julie Anderson , Deputy Director U.S. EPA Region 9, 75 Hawthorne Street San Francisco, CA 94105 Phone:415-947-4260 E-mail:Anderson.Julie@epa.gov	加州環境噪音污染管制方式研習 The study of the environmental noise control in California
九十二年八月 五日（二） 2003/8/5	加州奧克蘭 Oakland,CA	楊清明博士,加州灣區州政府主要計畫經理 Dr. Chin Ming Yang, Principal and Project Manager Association of Bay Area Government (ABAG),	楊清明博士,加州灣區州政府 主要計畫經理 Dr. Chin Ming Yang, Principal and Project Manager Association of Bay Area Government (ABAG), 101 8th Street, Oakland, California 94607	灣區政府噪音管制方式及環境監測事務研習 To study the noise monitoring affairs and the regulations of Bay Area Government

			Phone: 510-464-7925 Email:Chiny@abag.ca.gov	
九十二年八月 六日（三） 2003/8/6	舊金山 San Francisco	約翰懷司博士,美國環保署前第九區 代局長 Dr.John Wise,Previously EPA Region 9, Deputy Administrator,1227Josephine St.Berkeley, San Francisco, CA 94105	約翰懷司博士,美國環保署前第九區 代局長 Dr.John Wise,Previously EPA Region 9, Deputy Administrator,1227Josephine St.Berkeley, San Francisco, CA 94105. Phone:510-527-6590 Mobile phone:510-501-5374 E-mail:jcwise@pacbell.net	美國噪音管制實務研習 Noise control affairs of the United State
九十二年八月 七日（四） 2003/8/7	舊金山至 華盛頓特區 San Francisco To Washington DC	搭機-行程	搭機-行程	搭機-行程

九十二年八月八日（五） 2003/8/8	華盛頓特區 Washington DC	楊仁泰博士,資深計畫經理, 國際事務辦公室, 美國環保署 Dr. Jentai Yang, Senior Program Manger Office of International Affairs (OIA 2650R) U.S. Environmental Protection Agency Mr. Ken Feith Office of Policy Analysis Review Office of Air and Radiation 202 564 1679 Email: Feith.Ken@epa.gov	楊仁泰博士,資深計畫經理 國際事務辦公室, 美國環保署 Dr. Jentai Yang, Senior Program Manger, Office of International Affairs (OIA 2650R) U.S. Environmental Protection Agency, 1200 Pennsylvania Ave, Washington, DC 20004 Phone: 202- 564 6429 Fax: 202- 565 -2412 Email: Yang.Jentai@EPA.gov	美國政府噪音污染管制政策及環境音量監測實務及操作系統研習 U.S. Government policy concerning noise pollution control and the study of the environmental noise monitoring affairs and the operation system
九十二年八月九日（六） 2003/8/9	華盛頓特區 Washington DC	收集資料及撰寫報告	收集資料及撰寫報告	收集資料及撰寫報告

九十二年八月十日（日） 2003/8/10	華盛頓特區 Washington DC	收集資料及撰寫報告	收集資料及撰寫報告	收集資料及撰寫報告
九十二年八月十一日（一） 2003/8/11	馬里蘭州巴爾的摩市 Baltimore, Maryland	蔡史坦立博士,部長，馬里蘭州政府 Dr. Stan Tsai , Administrator, Maryland Department of the Environment	蔡史坦立博士,部長，馬里蘭州政府 Dr. Stan Tsai , Administrator, Maryland Department of the Environment, Environmental Permits Service Center1800 Washington Blvd.Baltimore, MD 21230 e-mail: stsai@mde.state. Tel: 410-537-4478 Fax: 410-537-4477	馬里蘭州政府噪音污染管制機制研習 Noise control mechanism of Maryland
九十二年八月十二日（二） 2003/8/12	華盛頓特區 Washington DC	馬蓋爾博士，資深計畫經理，美國環保署 Dr.Robert E. McGaughy Dr.	馬蓋爾博士，資深計畫經理，美國環保署 Dr.Robert E. McGaughy(8623-D) Senior Program Manger	各國環境音量標準比較與分析 The comparison and analysis of the

		Senior Program Manger U.S. Environmental Protection Agency	U.S. Environmental Protection Agency 1200 Pennsylvania Ave,N.W. Washington,DC 20460 USA Tel:-202-564-3244 e-mail:mcgaughy.robert@epa.gov	Environmental noise Standard of different countries
九十二年八月十二日（二） 2003/8/12	華盛頓特區至紐約 Washington DC to New York	搭機-行程	搭機-行程	搭機-行程
九十二年八月十三日（三） 2003/8/13	紐約 New York	李約翰博士,資深計畫經理，布魯克赫分國家實驗室 Dr. John C. Lee Senior Program Manger Brookhaven National Laboratory	李約翰博士,資深計畫經理，布魯克赫分國家實驗室 Dr.John C. Lee Senior Program Manger Brookhaven National Laboratory Upton, New York	環境音量監測實務及操作系統研習 Environmental noise monitoring affairs and the operation system

			Tel.: (1-631) 344-2248 Fax: (631) 344-5730 E-mail: jcl@bnl.gov	
九十二年八月 十四日（四） 2003/8/1 4	紐約 New York	藍夏禮秘書 駐紐約台北經濟文化辦事處 Peter Lan ,Secretary of Taipei Economic and Cultural Office in New York	藍夏禮秘書 駐紐約台北經濟文化辦事處 Peter Lan ,Secretary of Taipei Economic and Cultural Office in New York 90 Park Avenue, 31st Floor New York, NY10016-1301 Tel: (212) 557-5122 Fax:(212) 557-3043 E-mail: *roctaiwan@taipei.org*	參訪駐紐約台北經濟文化辦事處，了解紐約相關機構噪音管制方式 To visit Taipei Economic and Cultural Office in New York and visit the noise control mechanisms
九十二年八月 十五（五） 2003/8/15	紐約至台北 York to Taipei	搭機返台	搭機返台	搭機返台
九十二年八月	紐約至台北	搭機返台	搭機返台	搭機返台

十六（六） 2003/8/16	York to Taipei			
九十二年八月 十七(日) 2003/8/17	紐約至台北 York to Taipei	搭機返台	搭機返台	搭機返台

Draft

Environmental Noise Advisory Council
And
Interagency Noise Advisory Committee
Meeting Minutes
June 30, 2003
Aqua Conference Room, MDE

Attendees:

Dr. George Luz, Chair
Dr. Jerrie Cherry, Med Chi
George Harman, MDE
Robert Field, Council, MDE
Dave Jarinko, MDE
Rich Peppin, ScanTech
Pam Engle, DHMH
Katie McHugh, MD State Builders Assn.
Ken Polcak, DOT-SHA
John Quinn, Constellation Energy
Charles Zeleski, DHMH, Local Health
Michael Powell, Chamber of Commerce
Ron Nelson, MADE

Welcome and Introductions:

News Updates: Pam Engle, Health Department is filling Dave Roberts' vacancy. On the Interagency Committee, Lt. Col. Fred Sherbert, DNR, is retiring and will nominate Major Maurice Davis. Tammy Williams has been designated to representative the Department of Business and Economic Development. Those are the only changes to the Committee. Dr. Luz attended Noise COM 2003 and learned that next year's meeting will be held in Baltimore. Ken Polcak is the chair on one of the committees.

Status of Legislation: The House Bill (HB174/SB320), that the Council submitted, takes effect on July 1st, which provides for an expansion of members on the Advisory Council and Interagency Committee. Letters asking for appointments were sent out from our Acting Secretary's office. A process has not been defined for filling the general public vacancies. If anyone has any thoughts for possible nominees for the general public vacancies, please let George Harman know. The legislation broadened the responsibilities of the Council to allow for all noise issues to be discussed and not just the standards.

Presentation: Mr. Rich Peppin of ScanTech gave a presentation Everything You Need to Know About Noise Measurements followed by a demonstration on fast and slow

measurement settings on a noise meter. This presentation was provided electronically to members.

Since there was a quorum of the Council present (3 of 5), a vote was taken on which method the State should use in measuring noise that would appear in the regulations under Table 2. The Council agreed that the fast measurement should be used.

Community Self-Help Manual: Dr. Luz asked the members if it would be useful to make some previous noise documents available on a CD to raise awareness. It was agreed that a collection of information on noise information would be useful. Montgomery and PG Counties are currently rewriting noise guidelines. Some information from Montgomery County is on their web site at www.askdep.com.

Proposed Regulations: The latest version of the regulations were handed out and provided electronically to members. The Committee has been working on these regulations for the past year. The proposed changes to the regulations will be put into the proper format for publication in the Maryland Register. These changes will address the eleven specific issues outlined in the latest draft, which was provided.

There was a vote of concurrence. Everyone agreed to all the changes.

(Note: Some additional proposed editorial changes in definitions, references, and formulas were to be submitted by Rich Peppin. These are included in the latest version - attached)

Future Meetings: Presentations from other state agencies, technical presentations, local governments, medical presentations, were considered as being desirable.

Monthly meetings were no longer considered to be necessary since the majority of issues initially presented have been discussed. It was proposed that the Council and Committee meet three times a year: after the legislative session -April, in the early fall - September, and before the legislative session - December. The next meetings will be September 15th and December 15th.

The Old Dominion/Rock Springs peaking power plant came on line in Cecil County recently. Through the review process of the Power Plant Research Program, the project was advised of the noise standards and goals. Apparently, the noise mitigation design that was incorporated into the facility has resulted in a minimum of extra noise in the community. With the plant was running at full power it was difficult to notice any changes in ambient noise levels at the property line.

Public Comment: Ron Nelson representing M.A.D.E., thanked the Council but also suggested/cautioned that there would resistance to promulgating the regulations because there was no legislative or public representation. Dr. Cherry responded by saying in the past year the Council did have public representation on the Council and all the changes

were discussed.

DRAFT June 30, 2003
Summary of the draft changes to MDE's noise regulations

1. Define "periodic noise" to mean those sounds with discrete on and off characteristics. The intent and practice of the Department has been to impose a 5-decibel penalty on noises with sharp and well-defined repetitive characteristics because of their higher level of intolerance. The current definition is ambiguous in regard to the character of these sounds. The intent of the change is to clearly define those noises that would be subject to the tighter standards. The proposed definition is generally recognized in the literature.
2. Impose the tighter standard for either periodic noises (impulse noise) or discrete tones, rather than the current language, which could be implied to indicate that both needed to be occurring together. In essence, replace AND with OR.
3. Create a new performance based standard for dirt bikes and associated vehicles. Since it is almost impossible to measure a violation because of the usually sporadic nature of the noise and the ability of the source to stop operations upon the arrival of an inspector, it is considered highly desirable to create a standard that can be enforced without an actual noise measurement, and require the alleged offender to demonstrate compliance potential to the Department. Standard noise attenuation tables suggest that the proposed distance will result in compliance.
4. Provide for the exemption of sounds relating to emergency AND HAZARDOUS conditions. The current language only exempts emergency situations. OSHA warning devices on trucks and other machinery could be argued to be protective and not reach the level of an emergency that would justify the exemption, which is now being afforded to warning devices.
5. Household tools when operated in normal circumstances should be exempt. The change regarding this exemption is to specify that normal household tools are exempt only during daytime hours. On rare occasions, complaints have been received from the public relating outdoor tool use during the night. Emergency needs would continue to be allowed.
6. Changes were not made to the regulations concerning gun clubs when the statute was modified in 1983. Prior to that date, all gun clubs were regulated pursuant to a 1979 Attorney General's decision that included "sport shooting" in the definition of a sporting event. Following the 1983 change, and other subsequent changes, the legislature has affirmed that some gun clubs in certain counties after certain dates would be required to adhere to the standards. The proposed changes in the regulations are intended to conform to the intent of the statute. To accomplish this, gun clubs are being removed from the general exemptions for sporting events, and they are being placed in their own paragraph, which mirrors the statute.
7. Household pets (primarily barking dogs) often create nuisance situations. The Department wants to establish that household pets are not regulated at the state level. Complaints associated with these types of circumstances should be handled by the local jurisdictions through their animal control or police agencies. The Department will continue to provide assistance in complex situations when large numbers of pets are involved and zoning violations are occurring in residential situations, and in commercial kennel situations. The Department does not have the type of policing authority to handle these domestic situations.
8. Trash collections, especially commercial dumpster collections, almost always exceed noise standards if there is a residential situation within 200 feet. We are strongly encouraging

collection companies to arrange for trash pick up during the day to avoid complaints. Therefore, it is necessary to provide an exemption for these activities during the daytime.

9. Requests for variances involve a number of formal procedures that can impose a modest cost to the Department. Advertisement costs are already the responsibility of the applicant and public facilities are usually acquired at minimal costs. Thus, the Department is proposing that the court reporter and transcript costs be assigned to the applicant. Costs would vary depending upon the scope of the variance request. Minor variance situations with limited witnesses and hearing time could result in costs of no more than a few hundred dollars.

10. Table 2 Heading Addition - **(MEASURED AS FAST L_{MAX}). Noise levels have been historically measured in either Fast or Slow modes. When the regulations were developed 30 years ago, analog equipment was the norm and those instruments required that a Slow setting be used to reduce the rapid fluctuations that prevented precise measurements. Current digital equipment is now available for precise readings in the Fast mode. MDE has been using the Fast measurement mode for many years and is simply proposing to clarify its long-standing policy for using this widely accepted method.**

Draft for Discussion Only

Regulatory Change Proposals
July 25, 2003

Title 26

DEPARTMENT OF THE ENVIRONMENT

Subtitle 02 OCCUPATIONAL, INDUSTRIAL, AND RESIDENTIAL HAZARDS

Chapter 03 Control of Noise Pollution

Authority: Environment Article §3-401,
Annotated Code of Maryland

Preface

The Environmental Noise Act of 1974 of the State of Maryland declares as policy the limitation of noise to that level which will protect the health, general welfare, and property of the people of the State. It requires that the Department assume responsibility for the jurisdiction over the level of noise, and prepare regulations for the control of noise, including the establishment of standards for ambient noise levels and equipment performance with respect to noise, for adoption by the Secretary of the Environment. Enforcement of the regulations and standards is the responsibility of the Department in all areas, using the facilities and services of local agencies within the areas to the greatest extent possible. The Department shall coordinate the programs of all State agencies relating to noise abatement, and each State agency prescribing sound level limits or regulations respecting noise shall obtain the endorsement of the Department in prescribing any limits or regulations.

.01 Definitions.

A. "ANSI" means American national standards institute or its successor bodies.

B. "Construction" means any site preparation, assembly, erection, repair, alteration, or similar activity.

C. "Day-night average sound level (L_{dn})" means in decibels, the energy average sound level for a 24-hour day with a 10 decibel penalty applied to noise occurring during the nighttime period; i.e., noise levels occurring during the period from 10 p.m. one day until 7 a.m. the next are treated as though they were 10 dBA higher than they actually are. The use of the A-weighting is understood. The mathematical expression for L_{dn} is as follows:

$$L_{dn} = 10\log_{10}\left[\left(\frac{15}{24}\right)10^{Ld/10} + \left(\frac{9}{24}\right)10^{(L_n+10)/10}\right]$$

Where L_d = the daytime average sound level.

L_n = the nighttime average sound level.

D. "dBA" means abbreviation for the sound level in decibels determined by the A-weighting network of a sound level meter or by calculation from octave band or one-third octave band data.

E. "Daytime hours" means 7 a.m. to 10 p.m., local time.

F. "Decibel (dB)" means a unit of measure equal to ten times the logarithm to the base ten of the ratio of ~~a particular sound pressure squared to a standard reference pressure squared.~~ THE SQUARE OF THE SOUND PRESSURE TO THE SQUARE OF A STANDARD REFERENCE PRESSURE. For the purpose of this subtitle, 20 micropascals shall be the standard reference pressure.

G. "Demolition" means any dismantling, destruction, or removal activities.

H. "Department" means the Department of the Environment.

I. "Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage, which demands immediate action.

J. "Environmental noise" means the noise that exists at any location from all sources.

K. "Environmental noise standards" means the goals for environmental noise, the attainment and maintenance of which, in defined areas and under specific conditions, are necessary to protect the public health and general welfare.

L. "equivalent sound level" (also "average sound level") means the level of a constant sound which, in a given situation and time period, would convey the same sound energy as does the actual time-varying sound during the same period. Equivalent sound level is the level of the time weighted, mean-square, A-weighted sound pressure. A numerical subscript may be used to indicate the time period under consideration; i.e., $L_{eq}(24)$ or $L_{eq}(8)$ for 24-hour and 8-hour periods, respectively. No subscript indicates a 24-hour period. The mathematical expression for the L_{eq} is as follows:

$$L_{eq} = 10 \log_{10}\left[\frac{1}{t_2 - t_1}\int_{t_1}^{t_2} 10^{L_A(t)/10}\, dt\right] \quad (dBA)$$

Where t_1 and t_2 are the beginning and ending times, respectively, of the period over which the average is determined, and $L_A(t)$ is the instantaneous A-weighted sound pressure level fluctuating with time.

M. "Nighttime hours" means 10 p.m. to 7 a.m., local time.

N. "Noise" means the intensity, frequency, duration and character of sound, including sound and vibration of sub-audible frequencies.

O. "Noise pollution" means the presence of noise of sufficient loudness, character, and duration, which whether from a single source or multiple sources, is, or may be predicted with reasonable certainly to be, injurious to health or which unreasonably interferes with the proper enjoyment of property or with any lawful business or activity.

P. "Periodic noise" means noise possessing a repetitive on-and-off characteristic **WITH A RAPID RISE TO MAXIMUM ~~PEAK~~ AND A SHORT DECAY NOT EXCEEDING 2 SECONDS.**

Q. "Person" means any individual, group of individuals, firm, partnership, voluntary association, or private, public, or municipal corporation, or political subdivision of the State, or Department, bureau, agency, or instrument of federal, State, or local government, responsible for the use of property.

R. "Prominent discrete tone" means any sound, which can be distinctly heard as a single pitch or a set of single pitches. For the purposes of this regulation, a prominent discrete tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the 2 contiguous one-third octave bands by 5 dB for center frequencies of 500 Hz and above and by 8 dB for center frequencies between 160 and 400 Hz and by 15 dB for center frequencies less than or equal to 125 Hz.

S. "Sound level" means, in decibels, the weighted sound pressure level measured by the use of a sound level meter. ~~satisfying the requirements of NASI S1.4 1971 "specifications for sound level meters"~~. Sound level and noise level are synonymous. The weighting employed shall always be specified.

T. "Sound level meter" means an instrument, meeting INTERNATIONAL ELECTROTECHNICAL COMMISSION AND AMERICAN NATIONAL STANDARDS INSTITUTE standards ~~ANSI S1.4 1971 "specifications for sound level meters"~~, comprising a microphone, an amplifier, an output meter, and frequency-weighting network(s) that is used for the measurement of sound pressure levels in a specified manner.

U. Sound pressure

1. "Sound pressure" means the ~~minute~~ fluctuations in atmospheric pressure, which accompany the passage of a sound wave.

~~2. For a steady sound, the value of the sound pressure average over a period of time.~~

2~~3~~. Sound pressure is usually measured in dynes per square centimeter (dyne/cm^2), or in newtons per square meter (N/m^2), or in micropascals (μPa).

V. "Sound pressure level" means, in decibels, 20 times the logarithm to the base ten of the ratio of a sound pressure to the reference sound pressure of 20 micropascals (20 micronewtons per square meter). In the absence of any modifier, the PRESSURE ~~level~~ is understood to be that of a root-mean-square pressure.

W. "Source" means any person or property, real or personal, contributing to noise pollution.

X. "Vibration" means any oscillatory motion of solid bodies.

Y. "Zoning district" means a general land use category, defined according to local subdivision, the activities and uses for which are generally uniform throughout the subdivision. For the purposes of this regulation, property which is not zoned "residential", "commercial", or "industrial", shall be classified according to use as follows:

(1) "Commercial" means property used for buying and selling goods and services;
(2) "Industrial" means property used for manufacturing and storing goods;
(3) "Residential" means property used for dwellings.

References for T. "Sound Level meter":

a. ANSI[1] S1.4-1983 (R 2001), American National Standard for Sound Level Meters
b. ANSI S1.43-1997 (R2002), American National Standard Specifications for Integrating-Averaging Sound Level Meters
c. IEC[2] 60651 Ed.1.2 b:1994, Sound level meters, International Electrotechnical Commission (IEC).
d. IEC 60804 Ed. 2.0 b:2000, Integrating-averaging sound level meters
e. IEC 61672-1:2002, "Electroacoustics- Sound level meters-Part 1: Specifications.

.02 Environmental Noise Standards.

A. Precepts.

(1) It is known that noise above certain levels is harmful tot he health of humans. Although precise levels at which all adverse health effects occur have not definitely been ascertained, it is known that one's well-being can be affected by noise through loss of sleep, speech interference, hearing impairment, and a variety of other psychological and physiological factors. The establishment of ambient noise standards, or goals, must provide margins of safety in reaching conclusions based on available data which relate noise exposure to health and welfare effects, with due consideration to technical and economic factors.

(2) The environmental noise standards set forth here represent goals expressed in terms of equivalent A-weighted sound levels which are protective of the public health and welfare. The ambient noise levels shall be achieved through application, under provisions of laws or regulations or otherwise, of means for reducing noise levels including, but not limited to, isolation of noise producing equipment, dampening of sound waves by insulation, equipment modification and redesign, and land use management.

B. Standards for Environmental Noise--General.

(1) The standards are goals for the attainment of an adequate environment. The standards set out in regulation .03 are intended to achieve these goals.

(2) The following sound levels represent the standards for the State by general zoning district:

Table 1
Environmental Noise Standards

Zoning district	*Level*	*Measure*
Industrial	70 dBA	$L_{eq}(24)$
Commercial	64 dBA	L_{dn}
Residential	55 dBA	L_{dn}

.03 General Regulations.

A. Noise and vibration prohibitions.

(1) A person may not cause or permit noise levels which exceed those specified in table 2 except as provided in §A (2) or (3), or §B, below.

Table 2
Maximum Allowable Noise Levels (dBA)
For Receiving Land Use Categories

[1] American National Standards Institute (ANSI), 25 W 43rd St, New York, NY 10036
[2] International Electrotechnical Commission (IEC), Geneva, Switzerland [I need to check this] available from, Acoustical Society of America, 35 Pinelawn Rd, #114E, Melville, NY 11747

(MEASURED AS FAST L_{MAX})

Effective date	*Day/Night*	*Industrial*	*Commercial*	*Residential*
	Day	75	67	65
Upon Adoption	Night	75	62	55

(2) A person may not cause or permit noise levels emanating from construction or demolition site activities, which exceed:

(a) 90 dBA during daytime hours;

(b) The levels specified in table 2 during nighttime hours

(3) A person may not cause or permit the emission of prominent discrete tones ~~and~~ **OR** periodic noises which exceed a level which is 5 dBA lower than the applicable level listed in Table 2.

(4) A person may not cause or permit beyond the property line of a source, vibration of sufficient intensity to cause another person to be aware of the vibration by such direct means as sensation of touch or visual observation of moving objects. The observer shall be located at or within the property line of the receiving property when vibration determinations are made.

(5) A PERSON SHALL NOT OPERATE OR PERMIT TO BE OPERATED AN OFF-ROAD INTERNAL COMBUSTION ENGINE POWERED RECREATIONAL VEHICLE, TO INCLUDE, BUT NOT LIMITED TO A DIRT BIKE, ALL TERRAIN VEHICLE, GO CART, SNOWMOBILE OR SIMILAR VEHICLES, ON PRIVATE PROPERTY, CLOSER THAN 300 FEET TO A NEIGHBORING RESIDENCE OR THE ASSOCIATED CURTILAGE WITHOUT THE WRITTEN PERMISSION OF THE AFFECTED RESIDENT, UNLESS IT CAN BE DEMONSTRATED TO THE DEPARTMENT THAT THE VEHICLE CAN BE OPERATED WITHIN THE NOISE LIMITS SPECIFIED IN TABLE 2 OF THIS REGULATION.

B.~~b~~. Exemptions.

(1) The provisions of this regulation may not apply to devices used solely for the purpose of warning, protecting, or alerting the public, or some segment thereof, of the existence of an emergency **OR HAZARDOUS** situation.

(2) The provisions of this regulation do not apply to the following:

(a) Household tools and portable appliances in normal usage **DURING DAYTIME HOURS.**

(b) Lawn care and snow removal equipment (daytime only) when used and maintained in accordance with the manufacturer's specifications.

(c) Agricultural field machinery when used and maintained in accordance with the manufacturer's specifications.

(d) Blasting operations for demolition, construction, and mining or quarrying (daytime only).

(e) Motor vehicles on public roads.

(f) Aircraft and related airport operations at airports licensed by the State aviation administration.

(g) Boats on State waters or motor vehicles on State lands under the jurisdiction of the Department of natural resources.

(h) Emergency operations.

(I) Pile driving equipment during the daytime hours of 8 a.m. to 5 p.m.

~~(j) Sound not electronically amplified created by sporting, amusement, and entertainment events and other public gatherings operating according to terms and conditions of the appropriate local jurisdictional body. This includes but is not limited to athletic contests, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. This exemption only applies between the hours of 7 a.m. and 12 midnight.~~

(J) SOUND, EXCEPT THOSE SOUNDS THAT ARE ELECTRONICALLY AMPLIFIED, CREATED BY SPORTING EVENTS (EXCEPT TRAP SHOOTING, SKEET SHOOTING, OR OTHER TARGET SHOOTING), ENTERTAINMENT EVENTS AND OTHER PUBLIC GATHERINGS OPERATING UNDER PERMIT OR PERMISSION OF THE APPROPRIATE LOCAL JURISDICTION. This includes but is not limited to athletic contests, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. THIS EXEMPTION ONLY APPLIES BETWEEN THE HOURS OF 7 AM AND MIDNIGHT. IN

FREDERICK COUNTY OR FREDERICK CITY, A FAIR LISTED IN THE MARYLAND AGRICULTURAL FAIRS AND SHOWS SCHEDULE THAT IS MAINTAINED BY THE MARYLAND AGRICULTURAL FAIR BOARD, OR ANY OTHER EVENT HELD ON THE SAME GROUNDS AND LISTED BY THE AGRICULTURAL FAIR BOARD SHALL BE EXEMPT FROM STATE NOISE REGULATIONS.

(k) Rapid rail transit vehicles and railroads.

(l) Construction and repair work on public property.

(m) Air conditioning or heat pump equipment used to cool or heat housing on residential property. For this equipment, a person may not cause or permit noise levels which exceed 70 dBA for air conditioning equipment at receiving residential property and 75 dBA for heat pump equipment at receiving residential property.

(N) HOUSEHOLD PETS ON RESIDENTIAL PROPERTY THAT ARE MAINTAINED IN ACCORDANCE WITH LOCAL ZONING REQUIREMENTS.

(O) TRAP SHOOTING, SKEET SHOOTING, OR OTHER TARGET SHOOTING BETWEEN THE HOURS OF 9 AM AND 10 PM ON ANY RANGE OR OTHER PROPERTY OF A SHOOTING SPORTS CLUB THAT IS CHARTERED AND IN OPERATION AS OF JANUARY 1, 2001. THIS EXEMPTION DOES NOT APPLY IN ALLEGANY, ANNE ARUNDEL, BALTIMORE CITY, CALVERT, CHARLES, GARRETT, HOWARD, MONTGOMERY, ST. MARY'S AND WASHINGTON COUNTIES.

(P) TRASH COLLECTION OPERATIONS BETWEEN THE HOURS OF 7 AM AND 10 PM.

Ce. Variance procedure.

(1) Any person who believes that meeting the requirements of §A, above, is not practical in a particular case may request an exception to its requirements.

(2) Requests submitted to the Department shall be in writing and shall include evidence to show that compliance is not practical.

(3) Upon receipt of a request for an exception, the Department shall schedule a hearing to be held within 60 days.

(4) The applicant for the exception, at least 30 days before the hearing date, shall advertise prominently the hearing by placing a notice in a newspaper of general circulation in the subdivision in which the facility or source for which the exception is sought is located. The notice shall include the name of the facility or source and such additional information as the Department may require.

(5) Based upon evidence presented at the hearing, the secretary may grant an exception to §A, above, for a period not to exceed 5 years under terms and conditions appropriate to reduce the impact of the exception.

(6) Exceptions shall be renewable upon receipt by the Department of evidence that conditions under which the exception was originally granted have not changed significantly.

(7) APPLICANTS SHALL BE RESPONSIBLE FOR PUBLIC HEARING COSTS, AS DIRECTED BY THE DEPARTMENT, TO INCLUDE THE HEARING ADVERTISEMENT, FACILITY RENTAL, COURT REPORTER, AND THE PREPARATION OF THE TRANSCRIPT OF THE HEARING.

Dd. Measurement

(1) The equipment and techniques employed in the measurement of noise levels may be those recommended by the Department, which may, but need not, refer to currently accepted standards or recognized organizations, including, but not limited to, the American National Standard Institute (ANSI), American Society for Testing and Materials (ASTM), Society of Automotive Engineers (SAE), and the United States Environmental Protection Agency (EPA).

(2) The measurement of noise levels shall be conducted at points on or within the property line of the receiving property or the boundary of a zoning district, and may be conducted at any point for the determination of identity in multiple source situations.

(3) Sound level meters used to determine compliance with regulation .03 shall meet or exceed the specifications FOR TYPE 2 ~~of the American National Standards Institute or its successor bodies ANSI s1.4-1971 for type ii~~ sound level meters.

.04 Emission Regulations.
Reserved.

.05 penalties

a. Civil penalty. Any person who willfully violates these regulations shall be liable to a civil penalty of not more than $10,000. Each day during which a violation continues there shall be liability for a separate penalty.

b. Plan for compliance. A violator who has submitted a plan for compliance with these regulations and has that plan or amendments to it approved by the secretary, upon recommendation of the Department, may not be considered to be in violation of these regulations as long as he acts in accordance with the original or amended plan.

Administrative history

Effective date August 6, 1975 (2:17 Md. R. 1189)

Regulation .01A-1, W-1 adopted effective February 15, 1982 (9:3 M. R. 222); repealed effective March 28, 1983 (10:6 Md. R. 558)

Regulations .01 and .03A, B, D amended effective September 14, 1977 (4:19 Md. R. 1468)

Regulation .01C amended effective march 28, 1983 (10:6 M. R. 558)

Regulations .01C, Q; .02B; .03B, D amended effective February 15, 1982 (9:3 Md. R. 222)

Regulation .03A amended as an emergency provision effective November 13, 1979 (6:24 Md. R. 1917); emergency status expired Mach 29, 1980

Regulation .03A and B amended effective March 28m, 1983 (10:6 Md. R. 558)

Regulation .04 repealed effective September14, 1977 (4:19 Md. R. 1468)

Chapter recodified from COMAR 10.20.01 to COMAR 26.02.03

From: "George Harman" <gharman@mde.state.md.us>
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Date: 04/03/2003 12:02PM
Subject: Noise Council

To all:
The legislative session is about to end and some time will now be available to get back to normal affairs and meetings.

It is proposed that we hold the next Noise Advisory Council and Interagency Committee meeting on Monday, May 19 from 9:00 to 12:00 at MDE's new offices at Montgomery Park. The Aeries meeting room is located adjacent to the lobby.

Directions:
From the north: Take the I-395 exit from I-95 toward Baltimore. Take the Martin Luther King Blvd ramp (right lane). Then get into the left lane of MLK Blvd. and turn left at the first light. That will be Washington Blvd. Proceed about one mile to the huge white building. Pass the light at Monroe St. and turn right into the RED parking lot.

From the south: Take I-95 to the Washington Blvd. ramp (second ramp inside of the beltway). At the end of the ramp turn left. Turn left into the RED parking lot immediately after crossing the railroad tracks.

Business items:
The legislature passed two bills relating to noise this year. Neither have yet been sent to the Governor.

The Council proposed bill from the Senate side (SB 320) passed 24 to 22 and then passed the House 137-1. The companion (HB 174) passed the House 120-15 and is still reported in Senate committee. Since SB 320 has passed both houses, it is unnecessary for the House bill to move forward. Except for an amendment that retained the exemption for residential HVAC units, these bills were as recommended by the Council.

Another bill sponsored by the Frederick County delegation exempts Frederick County agricultural fairs from all noise regulations. This Senate version of this bill passed 47-0 and 138-1 in the House. The Senate committee is still holding the House version (HB 215), but it is unnecessary.

Bills that have passed both houses should now be forwarded to the Governor.

Meeting business:
Proposed agenda items:
Legislation
Regulations
New members (assumes that the Governor signs the Council bill)
Meeting schedule (quarterly meetings from this point forward will be proposed)
Outreach to local governments
Remaining issues

If other topics are desired for discussion, please advise.
To Council and Committee members, please advise if you will be unable to attend.

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MEETING AGENDA
ENVIRONMENTAL NOISE ADVISORY COUNCIL
AND THE INTERAGENCY NOISE CONTROL COMMITTEE
Monday
June 30, 2003
9:00 AM to 12:00 PM
Aeris Room - Lobby
Maryland Department of the Environment
1800 Washington Blvd.

09:00 Welcome and Introductions

09:10 News updates

09:20 Status of Legislation - bill signed - eff. July 1.

09:30 Response Time - Fast versus Slow – Rich Peppin presentation
(for possible clarification of measurement settings for determination of Table 2 compliance)

10:00 Proposed Regulation changes – previously discussed

10:30 +/- Break

10:45 Community Self-Help Manual – Dr. George Luz - - Assemble a CD w/ ref. info - FHWA documents MN-CPPC re-writing regs. (Tom Ogle) (www.askdep.com)

11:00 Open discussion – future agenda items

11:25 Future meetings/schedule (3/yr.)
monthly, quarterly, etc., - day of month, time???
- Spring (Apr.). Fall (Sept) Dec. (mid)

11:30 Public comment

12:00 Adjourn

Monday 9AM) – 15th/Sept Dec. 15th

Short org. meeting w/ new Council (when new members in place) (those not attending → conf. call).

ENVIRONMENTAL NOISE ADVISORY COUNCIL June 2003	
Agency Representing	Member
Acoustical Society of America and the Institute of Noise Control Engineering	**George Luz, Ph.D.** Director, Environmental Health Engineering Center for Health Promotion and Preventive Medicine MCHB-TS-EEN Aberdeen Proving Ground MD 21010-5422 410-436-2306 FAX: 410-436-1026 Email: George.Luz@amedd.army.mil
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General public (2)	**Vacant**
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Maryland State Senate	**Senator John S. Astle *(ex officio)*** James Senate Office Building Presidential Wing 110 College Avenue Annapolis MD 21401-1991 410-841-3578 Email: john_astle@senate.state.md.us
Maryland Municipal League Mr. Scott A. Hancock, Executive Director 1212 West Street Annapolis, MD 21401-3635	**Vacant**
Maryland Association of Counties David S. Bliden, Executive Director 169 Conduit Street Annapolis, MD 21401	**Vacant**

INTERAGENCY NOISE ADVISORY COMMITTEE 06/30/03

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Summary of the draft changes to MDE's noise regulations

1. Define "periodic noise" to mean those sounds with discrete on and off characteristics. The intent and practice of the Department has been to impose a 5-decibel penalty on noises with sharp and well-defined repetitive characteristics because of their higher level of intolerance. The current definition is ambiguous in regard to the character of these sounds. The intent of the change is to clearly define those noises that would be subject to the tighter standards. The proposed definition is generally recognized in the literature.
2. Impose the tighter standard for either periodic noises (impulse noise) or discrete tones, rather than the current language, which could be implied to indicate that both needed to be occurring together. In essence, replace AND with OR.
3. Create a new performance based standard for dirt bikes and associated vehicles. Since it is almost impossible to measure a violation because of the usually sporadic nature of the noise and the ability of the source to stop operations upon the arrival of an inspector, it is considered highly desirable to create a standard that can be enforced without an actual noise measurement, and require the alleged offender to demonstrate compliance potential to the Department. Standard noise attenuation tables suggest that the proposed distance will result in compliance.
4. Provide for the exemption of sounds relating to emergency AND HAZARDOUS conditions. The current language only exempts emergency situations. OSHA warning devices on trucks and other machinery could be argued to be protective and not reach the level of an emergency that would justify the exemption, which is now being afforded to warning devices.
5. Household tools when operated in normal circumstances should be exempt. The change regarding this exemption is to specify that normal household tools are exempt only during daytime hours. On rare occasions, complaints have been received from the public relating outdoor tool use during the night. Emergency needs would continue to be allowed.
6. Changes were not made to the regulations concerning gun clubs when the statute was modified in 1983. Prior to that date, all gun clubs were regulated pursuant to a 1979 Attorney General's decision that included "sport shooting" in the definition of a sporting event. Following the 1983 change, and other subsequent changes, the legislature has affirmed that some gun clubs in certain counties after certain dates would be required to adhere to the standards. The proposed changes in the regulations are intended to conform to the intent of the statute. To accomplish this, gun clubs are being removed from the general exemptions for sporting events, and they are being placed in their own paragraph, which mirrors the statute.
7. Household pets (primarily barking dogs) often create nuisance situations. The Department wants to establish that household pets are not regulated at the state level. Complaints associated with these types of circumstances should be handled by the local jurisdictions through their animal control or police agencies. The Department will continue to provide assistance in complex situations when large numbers of pets are involved and zoning violations are occurring in residential situations, and in commercial kennel situations. The Department does not have the type of policing authority to handle these domestic situations.
8. Trash collections, especially commercial dumpster collections, almost always exceed noise standards if there is a residential situation within 200 feet. We are strongly encouraging collection companies to arrange for trash pick up during the day to avoid complaints. Therefore, it is necessary to provide an exemption for these activities during the daytime.

9. Requests for variances involve a number of formal procedures that can impose a modest cost to the Department. Advertisement costs are already the responsibility of the applicant and public facilities are usually acquired at minimal costs. Thus, the Department is proposing that the court reporter and transcript costs be assigned to the applicant. Costs would vary depending upon the scope of the variance request. Minor variance situations with limited witnesses and hearing time could result in costs of no more than a few hundred dollars.

10. Fast vs. slow response
Table V

Draft for Discussion Only

Regulatory Change Proposals
June 6, 2003

Title 26

DEPARTMENT OF THE ENVIRONMENT

Subtitle 02 OCCUPATIONAL, INDUSTRIAL, AND RESIDENTIAL HAZARDS

Chapter 03 Control of Noise Pollution

Authority: Environment Article §3-401,
Annotated Code of Maryland

Preface

The Environmental Noise Act of 1974 of the State of Maryland declares as policy the limitation of noise to that level which will protect the health, general welfare, and property of the people of the State. It requires that the Department assume responsibility for the jurisdiction over the level of noise, and prepare regulations for the control of noise, including the establishment of standards for ambient noise levels and equipment performance with respect to noise, for adoption by the Secretary of the Environment. Enforcement of the regulations and standards is the responsibility of the Department in all areas, using the facilities and services of local agencies within the areas to the greatest extent possible. The Department shall coordinate the programs of all State agencies relating to noise abatement, and each State agency prescribing sound level limits or regulations respecting noise shall obtain the endorsement of the Department in prescribing any limits or regulations.

.01 Definitions.

A. "ANSI" means American national standards institute or its successor bodies.

B. "Construction" means any site preparation, assembly, erection, repair, alteration, or similar activity.

C. "Day-night average sound level (L_{dn})" means in decibels, the energy average sound level for a 24-hour day with a 10 decibel penalty applied to noise occurring during the nighttime period; i.e., noise levels occurring during the period from 10 p.m. one day until 7 a.m. the next are treated as though they were 10 dBA higher than they actually are. The use of the A-weighting is understood. The mathematical expression for L_{dn} is as follows:

$$L_{dn} = 10\log_{10}\left[\left(\frac{15}{24}\right)10^{L_d+10} + \left(\frac{9}{24}\right)10^{(L_n+10)+10}\right]$$

Where L_d = the daytime average sound level.

L_n = the nighttime average sound level.

D. "dBA" means abbreviation for the sound level in decibels determined by the a-weighting network of a sound level meter or by calculation from octave band or one-third octave band data.

E. "Daytime hours" means 7 a.m. to 10 p.m., local time.

F. "Decibel (dB)" means a unit of measure equal to ten times the logarithm to the base ten of the ratio of a particular sound pressure squared to a standard reference pressure squared. For the purpose of this subtitle, 20 micropascals shall be the standard reference pressure.

G. "Demolition" means any dismantling, destruction, or removal activities.

H. "Department" means the Department of the Environment.

I. "Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage which demands immediate action.

J. "Environmental noise" means the noise that exists at any location from all sources.

K. "Environmental noise standards" means the goals for environmental noise, the attainment and maintenance of which, in defined areas and under specific conditions, are necessary to protect the public health and general welfare.

L. "equivalent sound level" (also "average sound level") means the level of a constant sound which, in a given situation and time period, would convey the same sound energy as does the actual time-varying sound during the same period. Equivalent sound level is the level of the time weighted, mean-square, A-weighted sound pressure. A numerical subscript may be used to indicate the time period under consideration; i.e., $L_{eq}(24)$ or $L_{eq}(8)$ for 24-hour and 8-hour periods, respectively. No subscript indicates a 24-hour period. The mathematical expression for the L_{eq} is as follows:

$$L^{eq} = 10\log_{10}\left[\frac{1}{t_2 - t_1}\int_{t_1}^{t_2} 10^{L_A(t)/10}\,dt\right] dBA$$

Where t_1 and t_2 are the beginning and ending times, respectively, of the period over which the average is determined, and $L_A(t)$ is the instantaneous A-weighted sound pressure level fluctuating with time.

M. "Nighttime hours" means 10 p.m. to 7 a.m., local time.

N. "Noise" means the intensity, frequency, duration and character of sound, including sound and vibration of sub-audible frequencies.

O. "Noise pollution" means the presence of noise of sufficient loudness, character, and duration, which whether from a single source or multiple sources, is, or may be predicted with reasonable certainly to be, injurious to health or which unreasonably interferes with the proper enjoyment of property or with any lawful business or activity.

(1) P. "Periodic noise" means noise possessing a repetitive on-and-off characteristic **WITH A RAPID RISE TO PEAK AND A SHORT DECAY NOT EXCEEDING 2 SECONDS.**

Q. "Person" means any individual, group of individuals, firm, partnership, voluntary association, or private, public, or municipal corporation, or political subdivision of the State, or Department, bureau, agency, or instrument of federal, State, or local government, responsible for the use of property.

R. "Prominent discrete tone" means any sound which can be distinctly heard as a single pitch or a set of single pitches. For the purposes of this regulation, a prominent discrete tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the 2 contiguous one-third octave bands by 5 dB for center frequencies of 500 Hz and above and by 8 dB for center frequencies between 160 and 400 Hz and by 15 dB for center frequencies less than or equal to 125 Hz.

S. "Sound level" means, in decibels, the weighted sound pressure level measured by the use of a sound level meter satisfying the requirements of NASI S1.4 1971 "specifications for sound level meters". Sound level and noise level are synonymous. The weighting employed shall always be specified.

T. "Sound level meter" means an instrument, meeting ANSI S1.4 1971 "specifications for sound level meters", comprising a microphone, an amplifier, an output meter, and frequency-weighting network(s) that is used for the measurement of sound pressure levels in a specified manner.

U. Sound pressure

1. "Sound pressure" means the minute fluctuations in atmospheric pressure which accompany the passage of a sound wave.

2. For a steady sound, the value of the sound pressure average over a period of time.

3. Sound pressure is usually measured in dynes per square centimeter (dyne/cm^2), or in newtons per square meter (N/m^2), or in micropascals.

V. "Sound pressure level" means, in decibels, 20 times the logarithm to the base ten of the ratio of a sound pressure to the reference sound pressure of 20 micropascals (20 micronewtons per square meter). In the absence of any modifier, the level is understood to be that of a root-mean-square pressure.

W. "Source" means any person or property, real or personal, contributing to noise pollution.

X. "Vibration" means any oscillatory motion of solid bodies.

Y. "Zoning district" means a general land use category, defined according to local subdivision, the activities and uses for which are generally uniform throughout the subdivision. For the purposes of this regulation, property which is not zoned "residential", "commercial", or "industrial", shall be classified according to use as follows:

(1) "Commercial" means property used for buying and selling goods and services;

(2) "Industrial" means property used for manufacturing and storing goods;

(3) "Residential" means property used for dwellings.

.02 Environmental Noise Standards.

A. Precepts.

(1) It is known that noise above certain levels is harmful tot he health of humans. Although precise levels at which all adverse health effects occur have not definitely been ascertained, it is known that one's well-being can be affected by noise through loss of sleep, speech interference, hearing impairment, and a variety of other psychological and physiological factors. The establishment of ambient noise standards, or goals, must provide margins of safety in reaching conclusions based on available data which relate noise exposure to health and welfare effects, with due consideration to technical and economic factors.

(2) The environmental noise standards set forth here represent goals expressed in terms of equivalent A-weighted sound levels which are protective of the public health and welfare. The ambient noise levels shall be achieved through application, under provisions of laws or regulations or otherwise, of means for reducing noise levels including, but not limited to, isolation of noise producing equipment, dampening of sound waves by insulation, equipment modification and redesign, and land use management.

B. Standards for Environmental Noise--General.

(1) The standards are goals for the attainment of an adequate environment. The standards set out in regulation .03 are intended to achieve these goals.

(2) The following sound levels represent the standards for the State by general zoning district:

Table 1
Environmental Noise Standards

Zoning district	*Level*	*Measure*
Industrial	70 dBA	$L_{eq}(24)$
Commercial	64 dBA	L_{dn}
Residential	55 dBA	L_{dn}

.03 General Regulations.

A. Noise and vibration prohibitions.

(1) A person may not cause or permit noise levels which exceed those specified in table 2 except as provided in §A (2) or (3), or §B, below.

Table 2
Maximum Allowable Noise Levels (dBA)
For Receiving Land Use Categories

Effective date	*Day/Night*	*Industrial*	*Commercial*	*Residential*
	Day	75	67	65
Upon Adoption	Night	75	62	55

Awtg fast Lmax. (10)

(2) A person may not cause or permit noise levels emanating from construction or demolition site activities which exceed:

(a) 90 dBA during daytime hours;
(b) The levels specified in table 2 during nighttime hours

(3) A person may not cause or permit the emission of prominent discrete tones ~~and~~ **OR** periodic noises which exceed a level which is 5 dBA lower than the applicable level listed in table 2. (2)

(4) A person may not cause or permit beyond the property line of a source, vibration of sufficient intensity to cause another person to be aware of the vibration by such direct means as sensation of touch or visual

observation of moving objects. The observer shall be located at or within the property line of the receiving property when vibration determinations are made.

(5) **A PERSON SHALL NOT OPERATE OR PERMIT TO BE OPERATED AN OFF-ROAD INTERNAL COMBUSTION ENGINE POWERED RECREATIONAL VEHICLE, TO INCLUDE, A DIRT BIKE, ALL TERRAIN VEHICLE, GO CART, SNOWMOBILE OR SIMILAR VEHICLES, ON PRIVATE PROPERTY, CLOSER THAN 300 FEET TO A NEIGHBORING RESIDENCE OR THE ASSOCIATED CURTILAGE WITHOUT THE WRITTEN PERMISSION OF THE AFFECTED RESIDENT, UNLESS IT CAN BE DEMONSTRATED TO THE DEPARTMENT THAT THE VEHICLE CAN BE OPERATED WITHIN THE NOISE LIMITS SPECIFIED IN TABLE 2 OF THIS REGULATION.** (3)

(NOTE: The following sentence was suggested, but is not recommended since there have never been any complaints regarding golf carts.) GOLF CARTS OPERATED ON A GOLF COURSE DURING SCHEDULED OPERATING HOURS ARE EXEMPT FROM THIS PARAGRAPH.

b. Exemptions.

(1) The provisions of this regulation may not apply to devices used solely for the purpose of warning, protecting, or alerting the public, or some segment thereof, of the existence of an emergency **OR HAZARDOUS** situation. (4)

(2) The provisions of this regulation do not apply to the following:

(a) Household tools and portable appliances in normal usage **DURING DAYTIME HOURS.** (5)

(b) Lawn care and snow removal equipment (daytime only) when used and maintained in accordance with the manufacturer's specifications.

(c) Agricultural field machinery when used and maintained in accordance with the manufacturer's specifications.

(d) Blasting operations for demolition, construction, and mining or quarrying (daytime only).

(e) Motor vehicles on public roads.

(f) Aircraft and related airport operations at airports licensed by the State aviation administration.

(g) Boats on State waters or motor vehicles on State lands under the jurisdiction of the Department of natural resources.

(h) Emergency operations.

(I) Pile driving equipment during the daytime hours of 8 a.m. to 5 p.m.

~~(j) Sound not electronically amplified created by sporting, amusement, and entertainment events and other public gatherings operating according to terms and conditions of the appropriate local jurisdictional body. This includes but is not limited to athletic contests, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. This exemption only applies between the hours of 7 a.m. and 12 midnight.~~

(J) SOUND, EXCEPT THOSE SOUNDS THAT ARE ELECTRONICALLY AMPLIFIED, CREATED BY SPORTING EVENTS (EXCEPT TRAP SHOOTING, SKEET SHOOTING, OR OTHE TARGET SHOOTING), ENTERTAINMENT EVENTS AND OTHER PUBLIC GATHERINGS OPERATING UNDER PERMIT OR PERMISSION OF THE APPROPRIATE LOCAL JURISDICTION. THIS INCLUDES BUT IS NOT LIMITED TO ATHLETIC CONTESTS, AMUSEMENT PARKS, CARNIVALS, FAIRGROUNDS, SANCTIONED AUTO RACING FACILITIES, PARADES, AND PUBLIC CELEBRATIONS. THIS EXEMPTION ONLY APPLIES BETWEEN THE HOURS OF 7 AM AND MIDNIGHT. (6)

(k) Rapid rail transit vehicles and railroads.

(l) Construction and repair work on public property.

(m) Air conditioning or heat pump equipment used to cool or heat housing on residential property. For this equipment, a person may not cause or permit noise levels which exceed 70 dBA for air conditioning equipment at receiving residential property and 75 dBA for heat pump equipment at receiving residential property.

(7) **(N) HOUSEHOLD PETS ON RESIDENTIAL PROPERTY THAT ARE MAINTAINED IN ACCORDANCE WITH LOCAL ZONING REQUIREMENTS.**

(O) TRAP SHOOTING, SKEET SHOOTING, OR OTHER TARGET SHOOTING BETWEEN THE HOURS OF 9 AM AND 10 PM ON ANY RANGE OR OTHER PROPERTY OF A SHOOTING SPORTS CLUB THAT IS CHARTERED AND IN OPERATION AS OF JANUARY 1, 2001. THIS EXEMPTION DOES NOT APPLY IN ALLEGANY, ANNE ARUNDEL, BALTIMORE CITY, CALVERT, CHARLES, GARRETT, HOWARD, MONTGOMERY, ST. MARY'S AND WASHINGTON COUNTIES. (6)

(P) TRASH COLLECTION OPERATIONS BETWEEN THE HOURS OF 7 AM AND 10 PM. (8)

c. Variance procedure.

(1) Any person who believes that meeting the requirements of §A, above, is not practical in a particular case may request an exception to its requirements.

(2) Requests submitted to the Department shall be in writing and shall include evidence to show that compliance is not practical.

(3) Upon receipt of a request for an exception, the Department shall schedule a hearing to be held within 60 days.

(4) The applicant for the exception, at least 30 days before the hearing date, shall advertise prominently the hearing by placing a notice in a newspaper of general circulation in the subdivision in which the facility or source for which the exception is sought is located. The notice shall include the name of the facility or source and such additional information as the Department may require.

(5) Based upon evidence presented at the hearing, the secretary may grant an exception to §A, above, for a period not to exceed 5 years under terms and conditions appropriate to reduce the impact of the exception.

(6) Exceptions shall be renewable upon receipt by the Department of evidence that conditions under which the exception was originally granted have not changed significantly.

(7) APPLICANTS SHALL BE RESPONSIBLE FOR PUBLIC HEARING COSTS TO INCLUDE THE HEARING ADVERTISEMENT, FACILITY RENTAL, COURT REPORTER, AND THE PREPARATION OF THE TRANSCRIPT OF THE HEARING. (9) ~~(if necessary)~~ as directed by Department

d. Measurement

(1) The equipment and techniques employed in the measurement of noise levels may be those recommended by the Department, which may, but need not, refer to currently accepted standards or recognized organizations, including, but not limited to, the American National Standard Institute (ANSI), American Society for Testing and Materials (ASTM), Society of Automotive Engineers (SAE), and the United States Environmental Protection Agency (EPA).

(2) The measurement of noise levels shall be conducted at points on or within the property line of the receiving property or the boundary of a zoning district, and may be conducted at any point for the determination of identity in multiple source situations.

(3) Sound level meters used to determine compliance with regulation .03 shall meet or exceed the specifications of the American National Standards Institute or its successor bodies ANSI s1.4-1971 for type ii sound level meters.

.04 Emission Regulations.

Reserved.

.05 penalties

a. Civil penalty. Any person who willfully violates these regulations shall be liable to a civil penalty of not more than $10,000. Each day during which a violation continues there shall be liability for a separate penalty.

b. Plan for compliance. A violator who has submitted a plan for compliance with these regulations and has that plan or amendments to it approved by the secretary, upon recommendation of the Department, may not be considered to be in violation of these regulations as long as he acts in accordance with the original or amended plan.

Administrative history

Effective date August 6, 1975 (2:17 Md. R. 1189)

Regulation .01A-1, W-1 adopted effective February 15, 1982 (9:3 M. R. 222); repealed effective March 28, 1983 (10:6 Md. R. 558)

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Chapter recodified from COMAR 10.20.01 to COMAR 26.02.03

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From: "George Harman" <gharman@mde.state.md.us>
To: <George.Luz@APG.AMEDD.ARMY.MIL>, <peppinr@asme.org>, <oglet@co.mo.md.us>, <bayroad@comcast.net>, <jcherry101@comcast.net>, <mharton@comcast.net>, <John.Quinn@constellation.com>, <pamelae@dhmh.state.md.us>, <zeleskc@dhmh.state.md.us>, <fsherbert@dnr.state.md.us>, <mcdavis@dnr.state.md.us>, <erniekent@earthlink.net>, <fschmitz@eng.umd.edu>, <stc921jhnsn@erols.com>, <valeriec.mdfb@erols.com>, <burner@friend.ly.net>, <ronelson@friend.ly.net>, <mpowell@gfrlaw.com>, <sharon_grosfeld@house.state.md.us>, <sandyw@iximd.com>, <staff@jphuntinglodge.com>, <jmiedusiewski@mail.semmes.com>, <MJames@MDChamber.org>, <EDOUGHERTY@MDCOUNTIES.ORG>, <djarinko@mde.state.md.us>, <hwoods@mde.state.md.us>, <rfield@mde.state.md.us>, <CandaceD@mdmunicipal.org>, <jnoonan@mdp.state.md.us>, <staianoengrg@mindspring.com>, <jcaffey@mmhaonline.org>, <Mark.Pfefferle@mncppc-mc.org>, <dshonerd@multistate.com>, <michael.begly@ngc.com>, <william.grabau@osha.gov>, <Dorothy.Guy@piperrudnick.com>, <roger.truitt@piperrudnick.com>, <john_astle@senate.state.md.us>, <kpolcak@sha.state.md.us>, <ACE@stateside.com>, <jes@stateside.com>, <mbabuild@toad.net>, <rgsmith@venable.com>, <cfsf123@yellowbananas.com>
Date: 06/23/2003 1:43PM
Subject: Noise Council - meeting June 30

To all:
The agenda for the June 30th meeting and a copy of the latest draft of the regulations, which will be discussed are attached.

Please call if you have any quesions.

George Harman
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MEETING AGENDA
ENVIRONMENTAL NOISE ADVISORY COUNCIL
AND THE INTERAGENCY NOISE CONTROL COMMITTEE
Monday
June 30, 2003
9:00 AM to 12:00 PM
Aeris Room - Lobby
Maryland Department of the Environment
1800 Washington Blvd.

09:00 Welcome and Introductions

09:10 News updates

09:20 Status of Legislation -

09:30 Response Time – Fast versus Slow – Rich Peppin presentation
(for possible clarification of measurement settings for determination of Table 2 compliance)

10:00 Proposed Regulation changes – previously discussed

10:30 +/- Break

10:45 Community Self-Help Manual – Dr. George Luz

11:00 Open discussion – future agenda items

11:25 Future meetings/schedule
monthly, quarterly, etc., - day of month, time???

11:30 Public comment

12:00 Adjourn

Summary of the draft changes to MDE's noise regulations

1. Define "periodic noise" to mean those sounds with discrete on and off characteristics. The intent and practice of the Department has been to impose a 5-decibel penalty on noises with sharp and well-defined repetitive characteristics because of their higher level of intolerance. The current definition is ambiguous in regard to the character of these sounds. The intent of the change is to clearly define those noises that would be subject to the tighter standards. The proposed definition is generally recognized in the literature.
2. Impose the tighter standard for either periodic noises (impulse noise) or discrete tones, rather than the current language, which could be implied to indicate that both needed to be occurring together. In essence, replace AND with OR.
3. Create a new performance based standard for dirt bikes and associated vehicles. Since it is almost impossible to measure a violation because of the usually sporadic nature of the noise and the ability of the source to stop operations upon the arrival of an inspector, it is considered highly desirable to create a standard that can be enforced without an actual noise measurement, and require the alleged offender to demonstrate compliance potential to the Department. Standard noise attenuation tables suggest that the proposed distance will result in compliance.
4. Provide for the exemption of sounds relating to emergency AND HAZARDOUS conditions. The current language only exempts emergency situations. OSHA warning devices on trucks and other machinery could be argued to be protective and not reach the level of an emergency that would justify the exemption, which is now being afforded to warning devices.
5. Household tools when operated in normal circumstances should be exempt. The change regarding this exemption is to specify that normal household tools are exempt only during daytime hours. On rare occasions, complaints have been received from the public relating outdoor tool use during the night. Emergency needs would continue to be allowed.
6. Changes were not made to the regulations concerning gun clubs when the statute was modified in 1983. Prior to that date, all gun clubs were regulated pursuant to a 1979 Attorney General's decision that included "sport shooting" in the definition of a sporting event. Following the 1983 change, and other subsequent changes, the legislature has affirmed that some gun clubs in certain counties after certain dates would be required to adhere to the standards. The proposed changes in the regulations are intended to conform to the intent of the statute. To accomplish this, gun clubs are being removed from the general exemptions for sporting events, and they are being placed in their own paragraph, which mirrors the statute.
7. Household pets (primarily barking dogs) often create nuisance situations. The Department wants to establish that household pets are not regulated at the state level. Complaints associated with these types of circumstances should be handled by the local jurisdictions through their animal control or police agencies. The Department will continue to provide assistance in complex situations when large numbers of pets are involved and zoning violations are occurring in residential situations, and in commercial kennel situations. The Department does not have the type of policing authority to handle these domestic situations.
8. Trash collections, especially commercial dumpster collections, almost always exceed noise standards if there is a residential situation within 200 feet. We are strongly encouraging collection companies to arrange for trash pick up during the day to avoid complaints.

Therefore, it is necessary to provide an exemption for these activities during the daytime.

9. Requests for variances involve a number of formal procedures that can impose a modest cost to the Department. Advertisement costs are already the responsibility of the applicant and public facilities are usually acquired at minimal costs. Thus, the Department is proposing that the court reporter and transcript costs be assigned to the applicant. Costs would vary depending upon the scope of the variance request. Minor variance situations with limited witnesses and hearing time could result in costs of no more than a few hundred dollars.

Draft for Discussion Only

Regulatory Change Proposals
June 6, 2003

Title 26

DEPARTMENT OF THE ENVIRONMENT

Subtitle 02 OCCUPATIONAL, INDUSTRIAL, AND RESIDENTIAL HAZARDS

Chapter 03 Control of Noise Pollution

Authority: Environment Article §3-401,
Annotated Code of Maryland

Preface

The Environmental Noise Act of 1974 of the State of Maryland declares as policy the limitation of noise to that level which will protect the health, general welfare, and property of the people of the State. It requires that the Department assume responsibility for the jurisdiction over the level of noise, and prepare regulations for the control of noise, including the establishment of standards for ambient noise levels and equipment performance with respect to noise, for adoption by the Secretary of the Environment. Enforcement of the regulations and standards is the responsibility of the Department in all areas, using the facilities and services of local agencies within the areas to the greatest extent possible. The Department shall coordinate the programs of all State agencies relating to noise abatement, and each State agency prescribing sound level limits or regulations respecting noise shall obtain the endorsement of the Department in prescribing any limits or regulations.

.01 Definitions.

A. "ANSI" means American national standards institute or its successor bodies.

B. "Construction" means any site preparation, assembly, erection, repair, alteration, or similar activity.

C. "Day-night average sound level (L_{dn})" means in decibels, the energy average sound level for a 24-hour day with a 10 decibel penalty applied to noise occurring during the nighttime period; i.e., noise levels occurring during the period from 10 p.m. one day until 7 a.m. the next are treated as though they were 10 dBA higher than they actually are. The use of the A-weighting is understood. The mathematical expression for L_{dn} is as follows:

$$L_{dn} = 10\log_{10}\left[\left(\frac{15}{24}\right)10^{L_d+10} + \left(\frac{9}{24}\right)10^{(L_n+10)+10}\right]$$

Where L_d = the daytime average sound level.

L_n = the nighttime average sound level.

D. "dBA" means abbreviation for the sound level in decibels determined by the a-weighting network of a sound level meter or by calculation from octave band or one-third octave band data.

E. "Daytime hours" means 7 a.m. to 10 p.m., local time.

F. "Decibel (dB)" means a unit of measure equal to ten times the logarithm to the base ten of the ratio of a particular sound pressure squared to a standard reference pressure squared. For the purpose of this subtitle, 20 micropascals shall be the standard reference pressure.

G. "Demolition" means any dismantling, destruction, or removal activities.

H. "Department" means the Department of the Environment.

I. "Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage which demands immediate action.

J. "Environmental noise" means the noise that exists at any location from all sources.

K. "Environmental noise standards" means the goals for environmental noise, the attainment and maintenance of which, in defined areas and under specific conditions, are necessary to protect the public health and general welfare.

L. "equivalent sound level" (also "average sound level") means the level of a constant sound which, in a given situation and time period, would convey the same sound energy as does the actual time-varying sound during the same period. Equivalent sound level is the level of the time weighted, mean-square, A-weighted sound pressure. A numerical subscript may be used to indicate the time period under consideration; i.e., $L_{eq}(24)$ or $L_{eq}(8)$ for 24-hour and 8-hour periods, respectively. No subscript indicates a 24-hour period. The mathematical expression for the L_{eq} is as follows:

$$L^{eq} = 10\log_{10}\left[\frac{1}{t_2 - t_1}\int_{t_1}^{t_2} 10^{L_A(t)/10}\,dt\right] dBA$$

Where t_1 and t_2 are the beginning and ending times, respectively, of the period over which the average is determined, and $L_A(t)$ is the instantaneous A-weighted sound pressure level fluctuating with time.

M. "Nighttime hours" means 10 p.m. to 7 a.m., local time.

N. "Noise" means the intensity, frequency, duration and character of sound, including sound and vibration of sub-audible frequencies.

O. "Noise pollution" means the presence of noise of sufficient loudness, character, and duration, which whether from a single source or multiple sources, is, or may be predicted with reasonable certainly to be, injurious to health or which unreasonably interferes with the proper enjoyment of property or with any lawful business or activity.

P. "Periodic noise" means noise possessing a repetitive on-and-off characteristic **WITH A RAPID RISE TO PEAK AND A SHORT DECAY NOT EXCEEDING 2 SECONDS.**

Q. "Person" means any individual, group of individuals, firm, partnership, voluntary association, or private, public, or municipal corporation, or political subdivision of the State, or Department, bureau, agency, or instrument of federal, State, or local government, responsible for the use of property.

R. "Prominent discrete tone" means any sound which can be distinctly heard as a single pitch or a set of single pitches. For the purposes of this regulation, a prominent discrete tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the 2 contiguous one-third octave bands by 5 dB for center frequencies of 500 Hz and above and by 8 dB for center frequencies between 160 and 400 Hz and by 15 dB for center frequencies less than or equal to 125 Hz.

S. "Sound level" means, in decibels, the weighted sound pressure level measured by the use of a sound level meter satisfying the requirements of NASI S1.4 1971 "specifications for sound level meters". Sound level and noise level are synonymous. The weighting employed shall always be specified.

T. "Sound level meter" means an instrument, meeting ANSI S1.4 1971 "specifications for sound level meters", comprising a microphone, an amplifier, an output meter, and frequency-weighting network(s) that is used for the measurement of sound pressure levels in a specified manner.

U. Sound pressure

1. "Sound pressure" means the minute fluctuations in atmospheric pressure which accompany the passage of a sound wave.

2. For a steady sound, the value of the sound pressure average over a period of time.

3. Sound pressure is usually measured in dynes per square centimeter (dyne/cm^2), or in newtons per square meter (N/m^2), or in micropascals.

V. "Sound pressure level" means, in decibels, 20 times the logarithm to the base ten of the ratio of a sound pressure to the reference sound pressure of 20 micropascals (20 micronewtons per square meter). In the absence of any modifier, the level is understood to be that of a root-mean-square pressure.

W. "Source" means any person or property, real or personal, contributing to noise pollution.

X. "Vibration" means any oscillatory motion of solid bodies.

Y. "Zoning district" means a general land use category, defined according to local subdivision, the activities and uses for which are generally uniform throughout the subdivision. For the purposes of this regulation, property which is not zoned "residential", "commercial", or "industrial", shall be classified according to use as follows:

(1) "Commercial" means property used for buying and selling goods and services;

(2) "Industrial" means property used for manufacturing and storing goods;

(3) "Residential" means property used for dwellings.

.02 Environmental Noise Standards.

A. Precepts.

(1) It is known that noise above certain levels is harmful tot he health of humans. Although precise levels at which all adverse health effects occur have not definitely been ascertained, it is known that one's well-being can be affected by noise through loss of sleep, speech interference, hearing impairment, and a variety of other psychological and physiological factors. The establishment of ambient noise standards, or goals, must provide margins of safety in reaching conclusions based on available data which relate noise exposure to health and welfare effects, with due consideration to technical and economic factors.

(2) The environmental noise standards set forth here represent goals expressed in terms of equivalent A-weighted sound levels which are protective of the public health and welfare. The ambient noise levels shall be achieved through application, under provisions of laws or regulations or otherwise, of means for reducing noise levels including, but not limited to, isolation of noise producing equipment, dampening of sound waves by insulation, equipment modification and redesign, and land use management.

B. Standards for Environmental Noise--General.

(1) The standards are goals for the attainment of an adequate environment. The standards set out in regulation .03 are intended to achieve these goals.

(2) The following sound levels represent the standards for the State by general zoning district:

Table 1
Environmental Noise Standards

Zoning district	*Level*	*Measure*
Industrial	70 dBA	$L_{eq}(24)$
Commercial	64 dBA	L_{dn}
Residential	55 dBA	L_{dn}

.03 General Regulations.

A. Noise and vibration prohibitions.

(1) A person may not cause or permit noise levels which exceed those specified in table 2 except as provided in §A (2) or (3), or §B, below.

Table 2
Maximum Allowable Noise Levels (dBA)
For Receiving Land Use Categories

Effective date	*Day/Night*	*Industrial*	*Commercial*	*Residential*
	Day	75	67	65
Upon Adoption	Night	75	62	55

(2) A person may not cause or permit noise levels emanating from construction or demolition site activities which exceed:

(a) 90 dBA during daytime hours;

(b) The levels specified in table 2 during nighttime hours

(3) A person may not cause or permit the emission of prominent discrete tones ~~and~~ **OR** periodic noises which exceed a level which is 5 dBA lower than the applicable level listed in table 2.

(4) A person may not cause or permit beyond the property line of a source, vibration of sufficient intensity to cause another person to be aware of the vibration by such direct means as sensation of touch or visual observation of moving objects. The observer shall be located at or within the property line of the receiving property when vibration determinations are made.

(5) A PERSON SHALL NOT OPERATE OR PERMIT TO BE OPERATED AN OFF-ROAD INTERNAL COMBUSTION ENGINE POWERED RECREATIONAL VEHICLE, TO INCLUDE, A DIRT BIKE, ALL TERRAIN VEHICLE, GO CART, SNOWMOBILE OR SIMILAR VEHICLES, ON PRIVATE PROPERTY, CLOSER THAN 300 FEET TO A NEIGHBORING RESIDENCE OR THE ASSOCIATED CURTILAGE WITHOUT THE WRITTEN PERMISSION OF THE AFFECTED RESIDENT, UNLESS IT CAN BE DEMONSTRATED TO THE DEPARTMENT THAT THE VEHICLE CAN BE OPERATED WITHIN THE NOISE LIMITS SPECIFIED IN TABLE 2 OF THIS REGULATION.

(NOTE: The following sentence was suggested, but is not recommended since there have never been any complaints regarding golf carts.) GOLF CARTS OPERATED ON A GOLF COURSE DURING SCHEDULED OPERATING HOURS ARE EXEMPT FROM THIS PARAGRAPH.

b. Exemptions.

(1) The provisions of this regulation may not apply to devices used solely for the purpose of warning, protecting, or alerting the public, or some segment thereof, of the existence of an emergency **OR HAZARDOUS** situation.

(2) The provisions of this regulation do not apply to the following:

(a) Household tools and portable appliances in normal usage **DURING DAYTIME HOURS.**

(b) Lawn care and snow removal equipment (daytime only) when used and maintained in accordance with the manufacturer's specifications.

(c) Agricultural field machinery when used and maintained in accordance with the manufacturer's specifications.

(d) Blasting operations for demolition, construction, and mining or quarrying (daytime only).

(e) Motor vehicles on public roads.

(f) Aircraft and related airport operations at airports licensed by the State aviation administration.

(g) Boats on State waters or motor vehicles on State lands under the jurisdiction of the Department of natural resources.

(h) Emergency operations.

(I) Pile driving equipment during the daytime hours of 8 a.m. to 5 p.m.

~~(j) Sound not electronically amplified created by sporting, amusement, and entertainment events and other public gatherings operating according to terms and conditions of the appropriate local jurisdictional body. This includes but is not limited to athletic contests, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. This exemption only applies between the hours of 7 a.m. and 12 midnight.~~

(J) SOUND, EXCEPT THOSE SOUNDS THAT ARE ELECTRONICALLY AMPLIFIED, CREATED BY SPORTING EVENTS (EXCEPT TRAP SHOOTING, SKEET SHOOTING, OR OTHE TARGET SHOOTING), ENTERTAINMENT EVENTS AND OTHER PUBLIC GATHERINGS OPERATING UNDER PERMIT OR PERMISSION OF THE APPROPRIATE LOCAL JURISDICTION. This includes but is not limited to athletic contests, amusement parks, carnivals, fairgrounds, sanctioned auto racing facilities, parades, and public celebrations. THIS EXEMPTION ONLY APPLIES BETWEEN THE HOURS OF 7 AM AND MIDNIGHT.

(k) Rapid rail transit vehicles and railroads.

(l) Construction and repair work on public property.

(m) Air conditioning or heat pump equipment used to cool or heat housing on residential property. For this equipment, a person may not cause or permit noise levels which exceed 70 dBA for air conditioning equipment at receiving residential property and 75 dBA for heat pump equipment at receiving residential property.

(N) HOUSEHOLD PETS ON RESIDENTIAL PROPERTY THAT ARE MAINTAINED IN ACCORDANCE WITH LOCAL ZONING REQUIREMENTS.

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(O) TRAP SHOOTING, SKEET SHOOTING, OR OTHER TARGET SHOOTING BETWEEN THE HOURS OF 9 AM AND 10 PM ON ANY RANGE OR OTHER PROPERTY OF A SHOOTING SPORTS CLUB THAT IS CHARTERED AND IN OPERATION AS OF JANUARY 1, 2001. THIS EXEMPTION DOES NOT APPLY IN ALLEGANY, ANNE ARUNDEL, BALTIMORE CITY, CALVERT, CHARLES, GARRETT, HOWARD, MONTGOMERY, ST. MARY'S AND WASHINGTON COUNTIES.

(P) TRASH COLLECTION OPERATIONS BETWEEN THE HOURS OF 7 AM AND 10 PM.

c. Variance procedure.

(1) Any person who believes that meeting the requirements of §A, above, is not practical in a particular case may request an exception to its requirements.

(2) Requests submitted to the Department shall be in writing and shall include evidence to show that compliance is not practical.

(3) Upon receipt of a request for an exception, the Department shall schedule a hearing to be held within 60 days.

(4) The applicant for the exception, at least 30 days before the hearing date, shall advertise prominently the hearing by placing a notice in a newspaper of general circulation in the subdivision in which the facility or source for which the exception is sought is located. The notice shall include the name of the facility or source and such additional information as the Department may require.

(5) Based upon evidence presented at the hearing, the secretary may grant an exception to §A, above, for a period not to exceed 5 years under terms and conditions appropriate to reduce the impact of the exception.

(6) Exceptions shall be renewable upon receipt by the Department of evidence that conditions under which the exception was originally granted have not changed significantly.

(7) APPLICANTS SHALL BE RESPONSIBLE FOR PUBLIC HEARING COSTS TO INCLUDE THE HEARING ADVERTISEMENT, FACILITY RENTAL, COURT REPORTER, AND THE PREPARATION OF THE TRANSCRIPT OF THE HEARING.

d. Measurement

(1) The equipment and techniques employed in the measurement of noise levels may be those recommended by the Department, which may, but need not, refer to currently accepted standards or recognized organizations, including, but not limited to, the American National Standard Institute (ANSI), American Society for Testing and Materials (ASTM), Society of Automotive Engineers (SAE), and the United States Environmental Protection Agency (EPA).

(2) The measurement of noise levels shall be conducted at points on or within the property line of the receiving property or the boundary of a zoning district, and may be conducted at any point for the determination of identity in multiple source situations.

(3) Sound level meters used to determine compliance with regulation .03 shall meet or exceed the specifications of the American National Standards Institute or its successor bodies ANSI s1.4-1971 for type ii sound level meters.

.04 Emission Regulations.

Reserved.

.05 penalties

a. Civil penalty. Any person who willfully violates these regulations shall be liable to a civil penalty of not more than $10,000. Each day during which a violation continues there shall be liability for a separate penalty.

b. Plan for compliance. A violator who has submitted a plan for compliance with these regulations and has that plan or amendments to it approved by the secretary, upon recommendation of the Department, may not be considered to be in violation of these regulations as long as he acts in accordance with the original or amended plan.

Administrative history

Effective date August 6, 1975 (2:17 Md. R. 1189)

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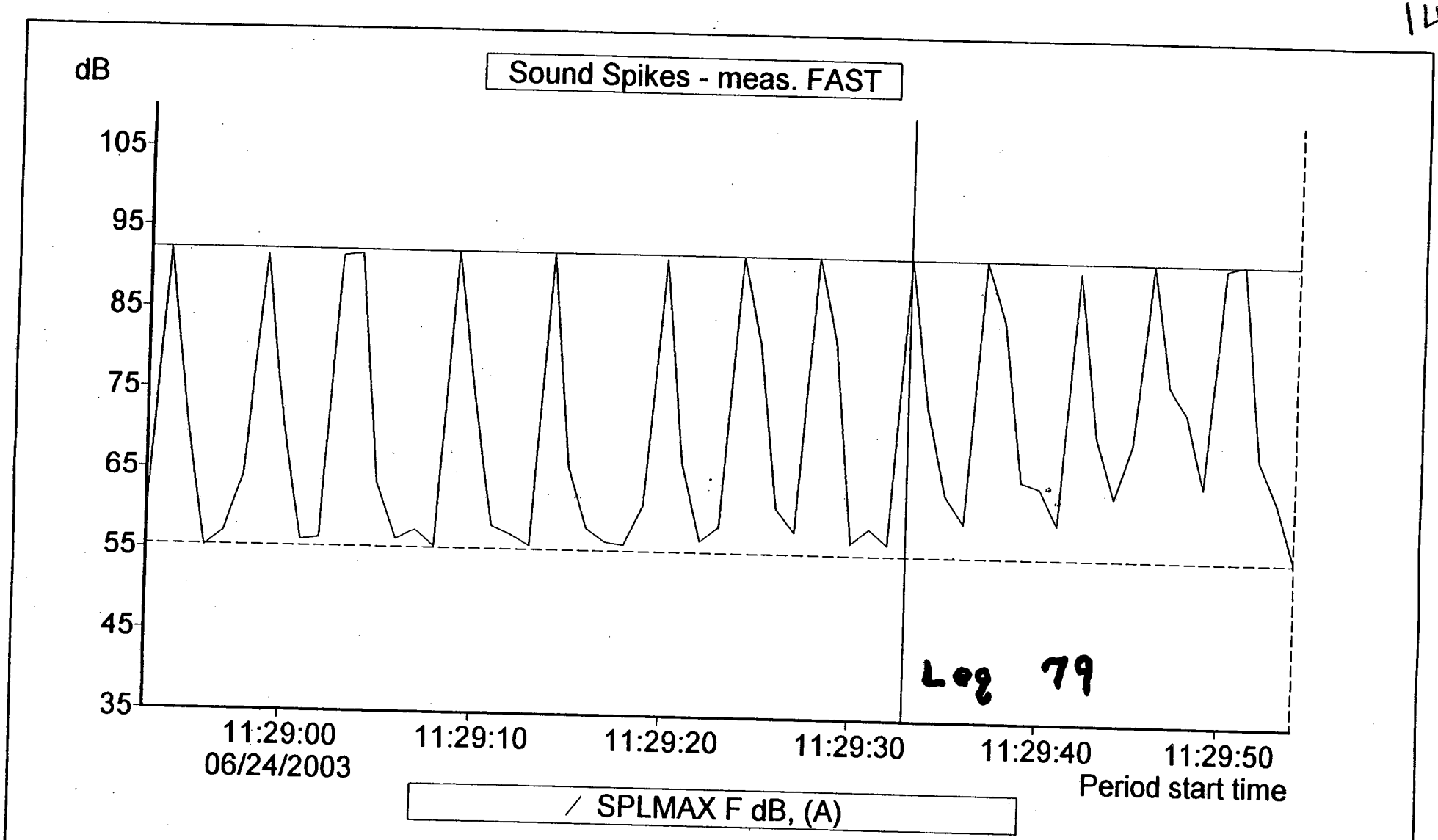
Chapter recodified from COMAR 10.20.01 to COMAR 26.02.03



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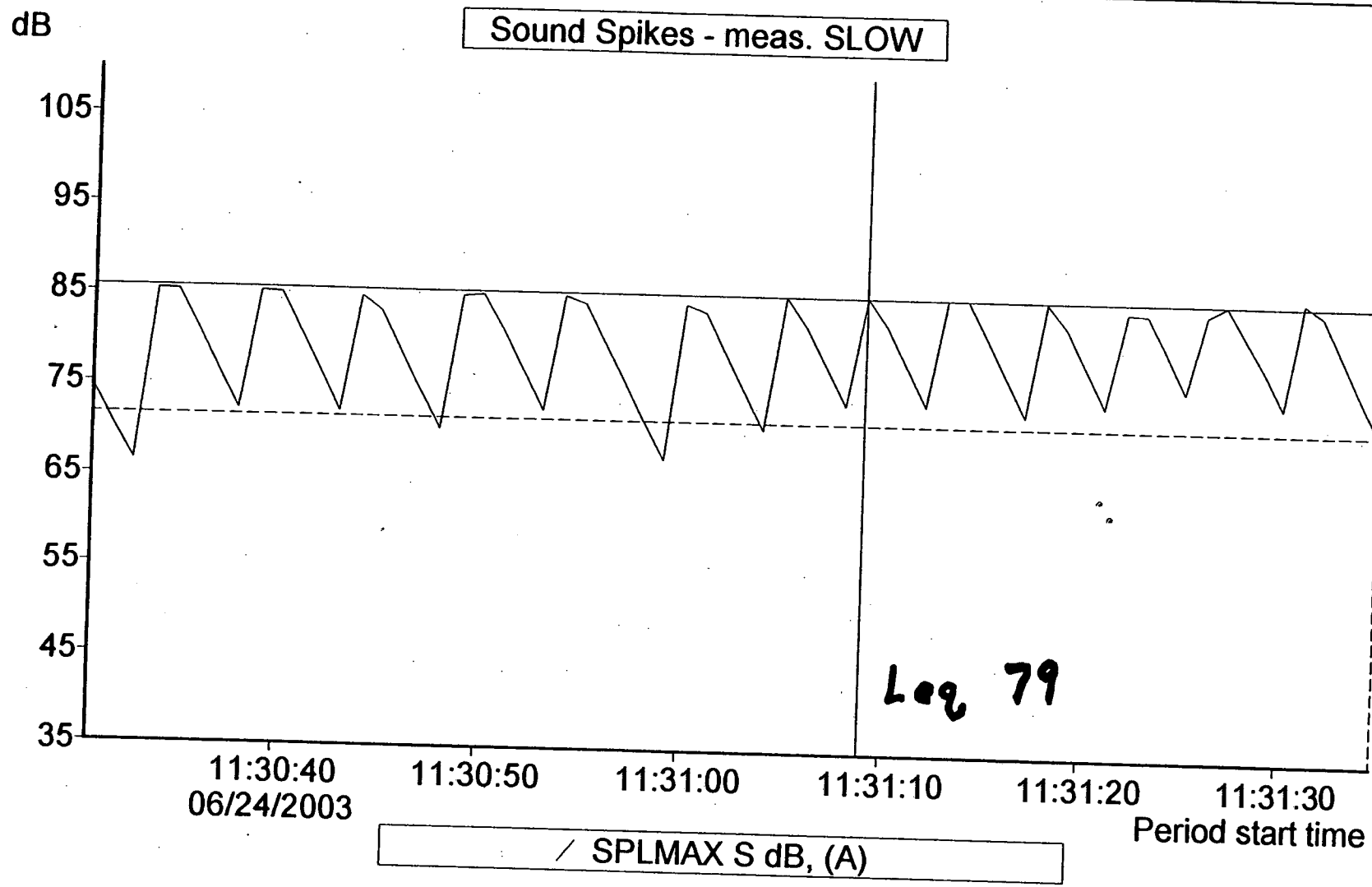

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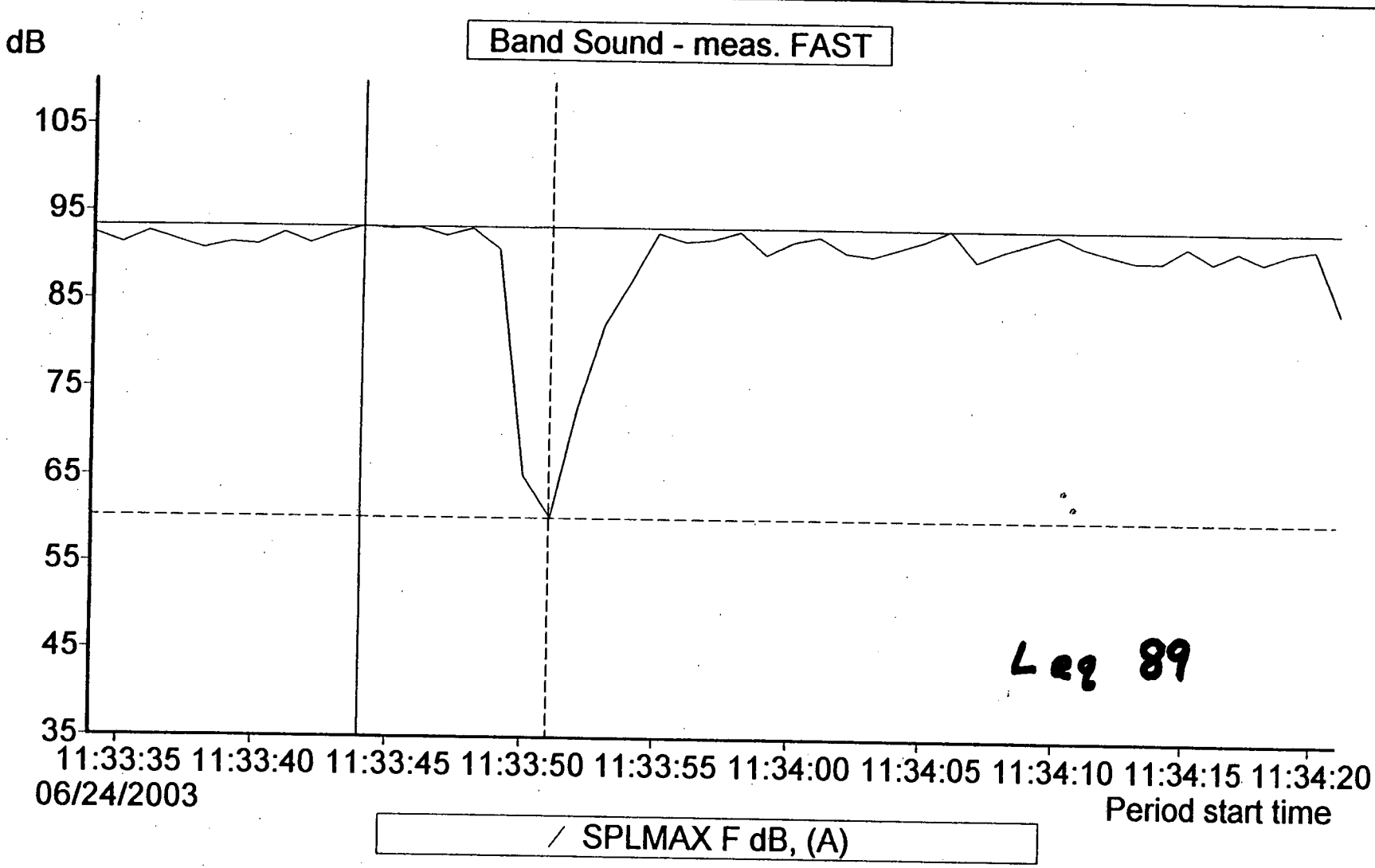

Leq 89

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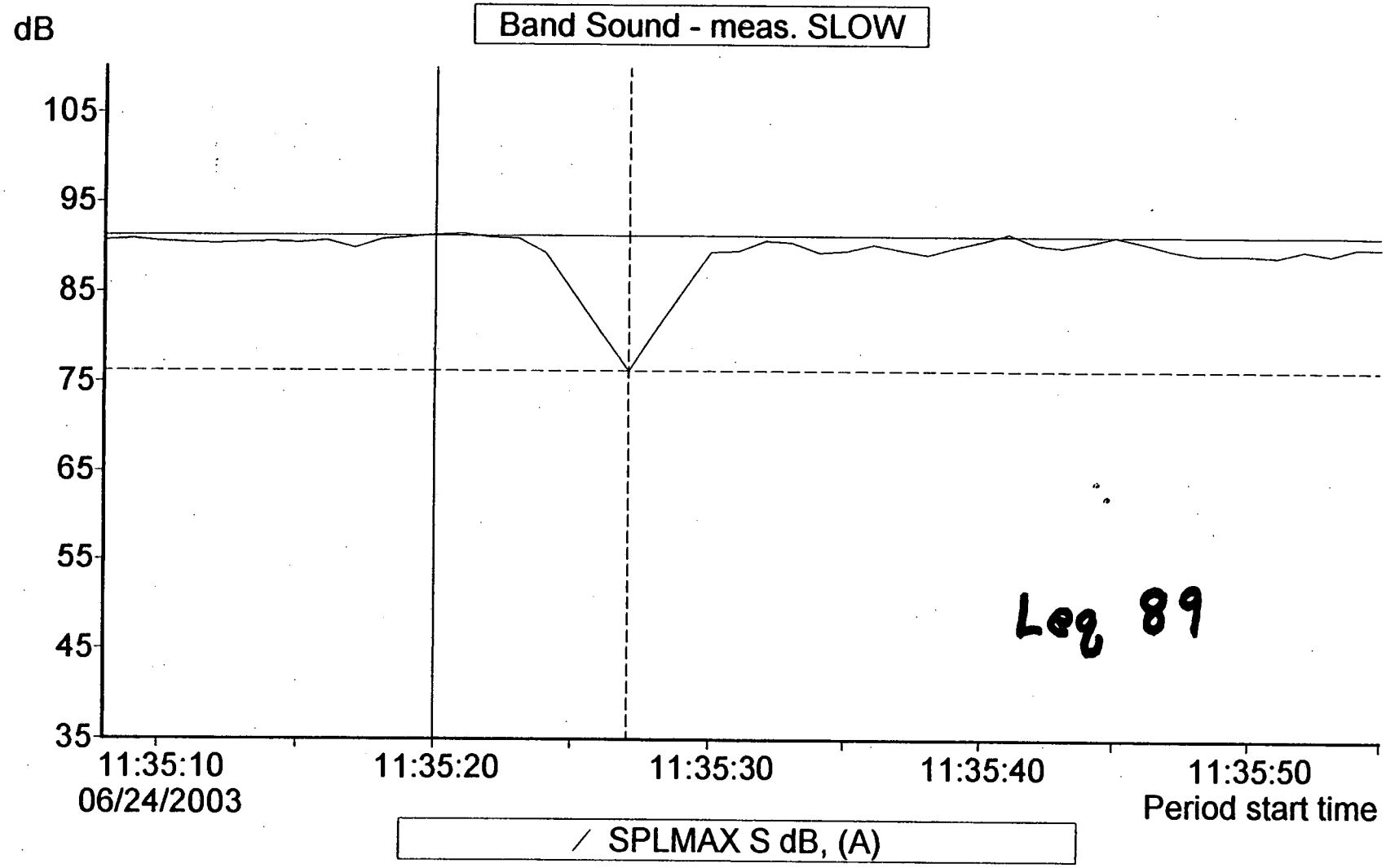

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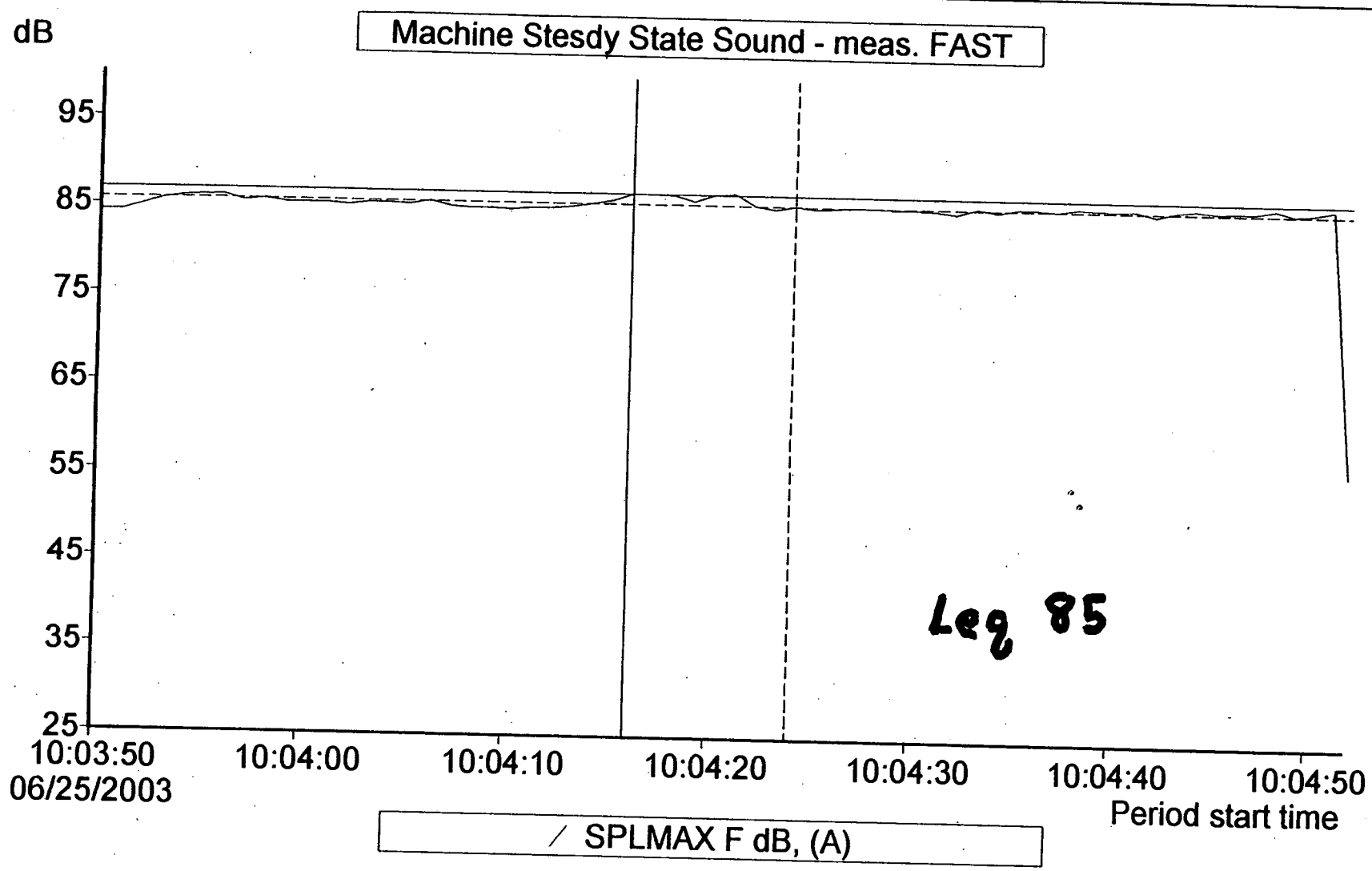

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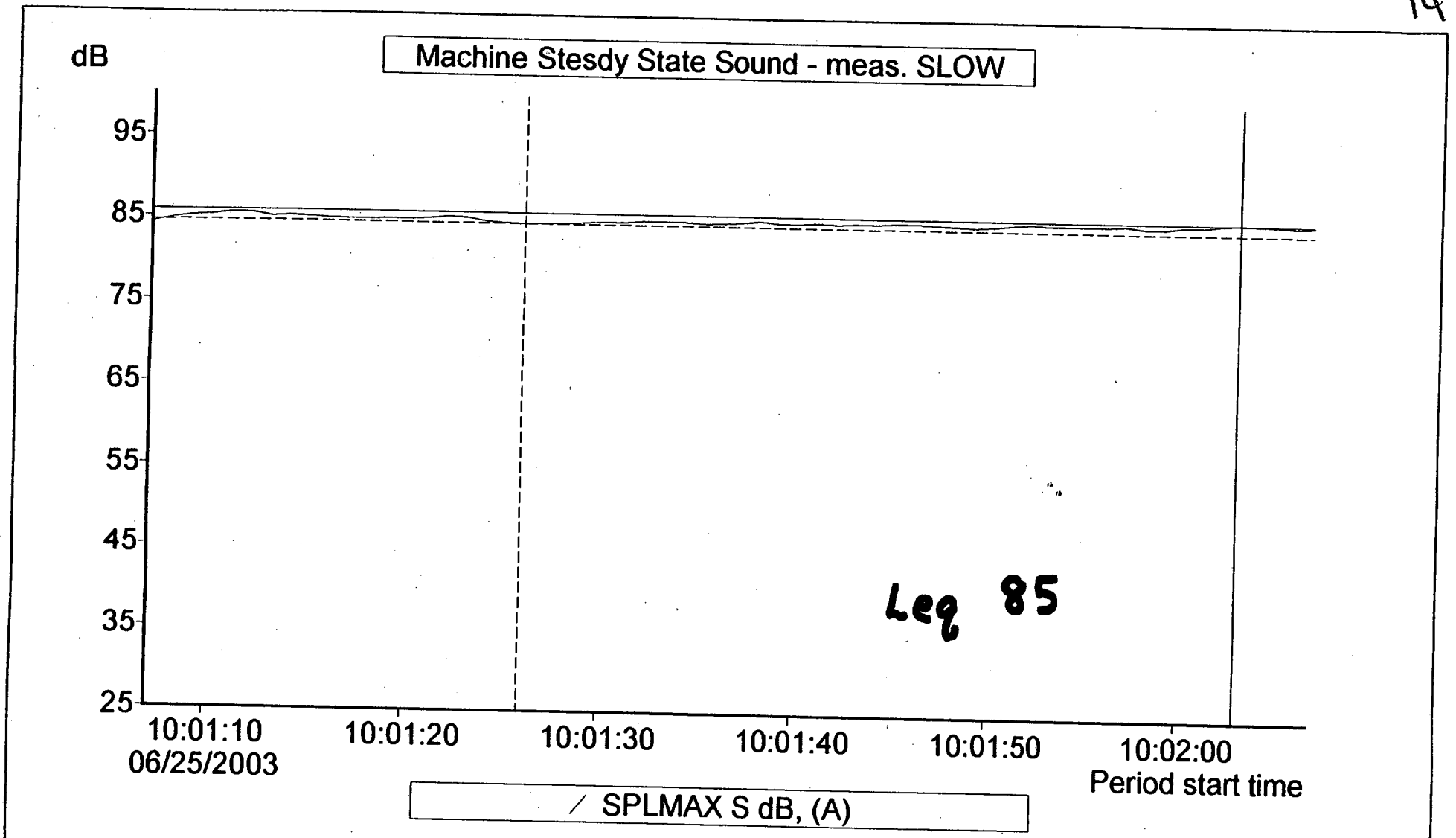

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Duration on / between the cursors = 000 00:00:38, Flags: ----, Scale: 1:1

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Date: 02/03/2003 4:37PM
Subject: noise legislation

To all:
This may be a second notice to some. I was having trouble with my GroupWise (GroupStupid).

HB 174 and SB 320 would enact the recommendations of the Council. A hearing for HB 174 is scheduled for Feb 12th at 1:00 in the Environmental Matters Committee. I will forward the hearing date for the senate bill when I get it.

Another bill, HB 215, will prohibit MDE from regulating noise from agricultural fairs and other activities held on those grounds.

Access to the bills, their status, and hearing dates is through the MD Electronic Capital.
www.mec.state.md.us
click on General Assembly, Bills, etc.
Please call or emial if you have questions or comments.

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Date: 01/16/2003 3:17PM
Subject: Noise Council

To All:
Noise Council update:

Many of you may have noted that the Governor's transition team is making changes in the administration. Among the changes has been the dismissal of my director, Mr. Robin Grove. Mr. Grove's departure from the Department will create a void that will be difficult to fill. In consideration of this situation, it will be not be possible to provide the level of planning support for the Council over the next few months as had been projected. Therefore, unless the members have a specific need to get together, it would be my intention to postpone the next meeting until at least April.

The changes in the law that were recommended are being offered for consideration by members of the House and Senate. Hopefully, sponsors for both bills will be found and the bills introduced. Initial discussions have been with Delegate Dan Morhaim and Senator Joan Carter Conway.

Updates on the bills will be provided during the session. Written and/or oral testimony may be needed or requested. Tracking can also be accomplished through the Internet at www.mec.state.md.us.

We are also in the process of preparing the changes in the regulations that had been previously agreed upon. These changes will not be formally proposed until at least the end of the current legislative session. Advance notice to the Council will be provided before the regulations are submitted.

Please call or email if you have any questions.

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MARYLAND DEPARTMENT
OF TRANSPORTATION

www.mdot.state.md.us

MODAL ADMINISTRATIONS

- Port Administration
- Motor Vehicle Administration
- Transit Administration
- Aviation Administration
- Maryland Transportation Authority
- State Highway Administration

Port Administration

- Baltimore
- Cargo – 30 million tons annually

Motor Vehicle Administration

- Vehicle registration
- Licensing
- Inspections – emissions, safety, vehicle noise limits

Transit Administration

- Buses
- Light rail
- MARC trains
- Subway
- FTA regulations
  - Environmental impact from project
  - Noise and vibration impacts

Aviation Administration

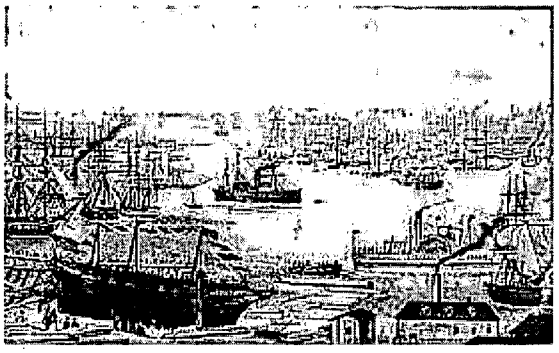
- Commercial (BWI)
- General Aviation
- Noise Programs
  - Monitoring System – 21 sites
  - Noise Zone (control incompatible development)
  - Voluntary Acquisition Program (relocation assistance)
  - Assistance Program (Resale assurance / soundproofing)

Maryland Transportation Authority

- Toll facilities
- Bridges
- Highways
- Tunnels
- Noise Barrier program
  - Self funded

State Highway Administration

- 16000 lane-miles of highway
- 2500 bridges
- Noise Policy (copy)
  - Federal approved
  - New construction (Type I)
  - Retrofit program (Type II)
    - Local noise ordnance requirement



Port of Baltimore History

Founded in 1706 on the banks of the Patapsco River, the Port of Baltimore has grown to become one of the busi ports on the East Coast of the United States. Originally established to transport farmers' crops along the Eastern seaboard, as well as cargoes to and from international destinations, today the port thrives on diversity. From autc to zinc, from Akron to Zhenjiang, the maritime center handles more than 30 million tons annually of all types of ca from around the world.

One of the Port of Baltimore's greatest advantages is its strategic Mid-Atlantic location and an inland setting that made it the closest atlantic port to major midwestern population and manufacturing centers.

In addition to its geographical location, the Port of Baltimore has long maximized its enviable locale by combining state-of-the-art facilities with efficient connections to points north, south and west.

The Port of Baltimore is regarded as one of America's top container terminals, providing technological advances have transformed port operations from clipboard to keyboard. The port boasts computerized gate complexes, har computers and scanners and the use of Electronic Data Interchange (EDI)- all which greatly increase the port's e and cost-effectiveness.

Economic Engine
The Port of Baltimore is a significant economic engine for the entire region, generating $1.4 billion in revenue anr and employing nearly 126,700 Marylanders in maritime-related jobs.

Jobs of Every Kind
Port-related jobs are diverse and include everything from truck drivers, longshoremen, tugboat operators, and rai workers, to employees of the Maryland Port Administration (MPA). The MPA is charged with stimulating the flow waterborne cargo through the entire port community, maintaining the terminals, and marketing the Port of Baltimc worldwide.

Other governmental agencies, such as U.S. Customs and the Army Corps of Engineers, along with the private se with its variety of businesses, play a vital role in making the Port of Baltimore successful.

From freight forwarders to bay pilots to warehouse operators- all contribute to making the Port of Baltimore efficie effective and easy to use.

BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT (BWI) NOISE ZONE

The Baltimore/Washington International Airport (BWI) Noise Zone was certified by the Maryland Aviation Administration (MAA) in 1998. The 1998 Airport Noise Zone (ANZ) contains 7,100 acres, a five percent reduction in size from the 1993 ANZ, 1,350 homes, which is 39 percent fewer than in 1993, and about 3,400 people, 41 percent fewer than in 1993.

The Maryland Environmental Noise Act of 1974 requires the MAA to adopt an Airport Noise Zone and Noise Abatement Plan to control incompatible land development around BWI Airport and to minimize the impact of aircraft noise on people living near the Airport. Airport noise zones are established to control incompatible development in areas where levels of cumulative aircraft noise exposure are equal to, or greater than, limits set by state and federal regulations. Individuals interested in completing any type of construction or changing the use of existing structures within the ANZ are required to obtain an airport zoning permit from the MAA. Permits for uses which are determined to be incompatible will be denied. Applicants may then request a variance from the Board of Airport Zoning Appeals. Approval from the Board must be granted prior to the issuance of any construction or use and occupancy permits from local government offices.

The MAA operates a permanent noise monitoring system that constantly measures noise levels at 21 remote monitoring sites in areas surrounding BWI Airport.

VOLUNTARY NOISE ACQUISITION PROGRAM

In 1985, the Maryland Aviation Administration (MAA) began to acquire residential properties which were determined to be severely impacted by aircraft noise. Property owners, who volunteer to participate, are paid fair market value for their property at its highest and best use, and are provided relocation assistance. Properties located in areas whose day-night average sound level (Ldn) is greater than 65, as determined by Airport Noise Zone contours, are eligible for this program provided the property has been zoned by local government to transition from residential to a compatible land use.

Progress of Program as of March 31, 2003:

Number of eligible properties	343
Properties acquired to date	246
Properties in process or on waiting list	5
Number of homeowners who have declined participation	43
Number of homeowners who have not applied	49
Acquisition expenditures to date (millions)	$39.7

For information about the Voluntary Noise Acquisition Program, contact the Maryland Aviation Administration's Real Estate Division at 410-859-7375.

Homeowners Assistance Program

HOMEOWNERS ASSISTANCE PROGRAM

In 1988, the Maryland Aviation Administration (MAA) began to offer financial assistance to those who are located in areas whose day-night average sound level (Ldn) is greater than 65, as determined by airport noise zone contours, but who are not eligible for the Voluntary Noise Acquisition Program. Voluntary participants in this program are required by State statute to grant an avigation easement. The easement permits aircraft operations over the property, provides notification to future owners of high cumulative aircraft noise levels, and is binding on all future owners.

The first option in this program, Resale Assurance, provides financial assistance to homeowners wishing to move from the Airport Noise Zone. The selected properties are appraised to determine their value as if they were located outside of the Airport Noise Zone. The second option, soundproofing, assists the homeowner in making modifications to the home with the goal of reducing interior noise levels to a Ldn of 45 decibels (dB).

Progress of Program as of March 31, 2003:

Number of eligible properties	902
Properties completed	653
Soundproofed	540
Resale assurance program	113
Properties in process	52
Soundproofing	51
Resale assurance program	1
Number of homeowners who have not applied	126
Homeowners Assistance expenditures to date (millions)	$17.6

For information about the Homeowners Assistance Program, contact the Maryland Aviation Administration's Real Estate Division at 410-859-7375.

The Maryland Transportation Authority assists the State in achieving its transportation goals by advancing the safe, secure and convenient movement of people and goods for the benefit of the citizens of Maryland.

Tolls, other revenues and bonding capacity are used to develop, operate, provide law enforcement for, and maintain the Authority's highways, bridges and tunnels, which serve as vital links in the State's transportation network. Acting on behalf of the Department of Transportation, the Authority also finances and constructs capital projects to improve Maryland's transportation system, including terminal facilities at the Port of Baltimore and the Baltimore/Washington International Airport. The Authority provides law enforcement at the port and airport facilities.

The Authority is committed to sound management practices, fiscal responsibility and prompt, courteous assistance to the traveling public. We are dedicated to teamwork, a diverse workforce and employee development.

Vision

Customers will move conveniently and safely through our facilities, as the Authority meets the demands of travel and commerce in the 21st century. The Authority will seek new ways to improve transportation in Maryland and the region through partnerships with the Maryland Department of Transportation and others. Innovative engineering, state-of-the-art technology, professional law enforcement and results-oriented management will be used to reach this vision.

The Authority will continuously strive to foster confidence and citizen pride in Maryland government.

Values

Authority members and employees commit to the following values:

- We are committed to preserving our facilities and assisting in the development of Maryland's transportation system. We are responsible stewards of Maryland's environment and natural resources. We maintain attractive facilities that contribute to traveler confidence and to the quality of the lives of customers, neighbors and our coworkers.

- We are committed to the safety and security of travelers, our neighbors and our coworkers.

- We respect our coworkers; trust, open communication and teamwork are essential to our success. The highest standards of integrity and honesty are required from all employees. We encourage and assist professional and individual development.

- We are committed to equal opportunity in employment and procurement.
- We value a pro-active, courteous approach to serving our customers and assisting them in times of need. We value fairness and understanding in interactions with customers we serve, our business partners our neighbors and our coworkers.
- We value cost-effective, results-oriented work practices. We recognize the Authority must continue to evolve in order to meet the needs of Maryland's citizens in the 21st century.

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23 CFR PART 772 - PROCEDURES FOR ABATEMENT OF HIGHWAY TRAFFIC NOISE AND CONSTRUCTION NOISE

AUTHORITY: 23 U.S.C. 109(h), 109(i); 42 U.S.C. 4331, 4332; sec. 339(b), Pub. L. 104-59, 109 Stat. 568, 605; 49 CFR 1.48(b).
(Source: 47 FR 29654, July 8, 1982; 47 FR 33956, Aug. 5, 1982, and 62 FR 42903, August 11, 1997)

Sec. 772.1 Purpose.

To provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways approved pursuant to Title 23, United States Code (U.S.C.).

Sec. 772.3 Noise Standards.

The highway traffic noise prediction requirements, noise analyses, noise abatement criteria, and requirements for informing local officials in this regulation constitute the noise standards mandated by 23 U.S.C. 109(i). All highway projects which are developed in conformance with this regulation shall be deemed to be in conformance with the Federal Highway Administration (FHWA) noise standards.

Sec. 772.5 Definitions.

(a) Design year. The future year used to estimate the probable traffic volume for which a highway is designed. A time, 10 to 20 years, from the start of construction is usually used.

(b) Existing noise levels. The noise, resulting from the natural and mechanical sources and human activity, considered to be usually present in a particular area.

(c) L_{10}. The sound level that is exceeded 10 percent of the time (the 90th percentile) for the period under consideration.

(d) $L_{10}(h)$. The hourly value of L10.

(e) L_{eq}. The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period.

(f) $L_{eq}(h)$. The hourly value of Leq.

(g) Traffic noise impacts. Impacts which occur when the predicted traffic noise levels approach

(6)

or exceed the noise abatement criteria (Table 1), or when the predicted traffic noise levels substantially exceed the existing noise levels.

(h) Type I projects. A proposed Federal or Federal-aid highway project for the construction of a highway on new location or the physical alteration of an existing highway which significantly changes either the horizonal or vertical alignment or increases the number of through-traffic lanes.

(i) Type II projects. A proposed Federal or Federal-aid highway project for noise abatement on an existing highway.

Sec. 772.7 Applicability.

(a) Type I projects. This regulation applies to all Type I projects unless it is specifically indicated that a section applies only to Type II projects.

(b) Type II projects. The development and implementation of Type II projects are not mandatory requirements of 23 U.S.C. 109(i) and are, therefore, not required by this regulation. When Type II projects are proposed for Federal-aid highway participation at the option of the highway agency, the provisions of Subsec. 772.9(c), 772.13, and 772.19 of this regulation shall apply.

Sec. 772.9 Analysis of Traffic Noise Impacts and Abatement Measures.

(a) The highway agency shall determine and analyze expected traffic noise impacts and alternative noise abatement measures to mitigate these impacts, giving weight to the benefits and cost of abatement, and to the overall social, economic and environmental effects.

(b) The traffic noise analysis shall include the following for each alternative under detailed study:

(1) Identification of existing activities, developed lands, and undeveloped lands for which development is planned, designed and programmed, which may be affected by noise from the highway;

(2) Prediction of traffic noise levels;

(3) Determination of existing noise levels;

(4) Determination of traffic noise impacts; and

(5) Examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts.

(c) Highway agencies proposing to use Federal-aid highway funds for Type II projects shall perform a noise analysis of sufficient scope to provide information needed to make the determination required by Sec. 772.13(a) of this chapter.

Sec. 772.11 Noise Abatement.

(a) In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit.

(b) In those situations where there are no exterior activities to be affected by the traffic noise, or where the exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities, the interior criterion shall be used as the basis of determining noise impacts.

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(c) If a noise impact is identified, the abatement measures listed in Sec. 772.13(c) of this chapter must be considered.

(d) When noise abatement measures are being considered, every reasonable effort shall be made to obtain substantial noise reductions.

(e) Before adoption of a final environmental impact statement or finding of no significant impact, the highway agency shall identify:

(1) Noise abatement measures which are reasonable and feasible and which are likely to be incorporated in the project, and

(2) Noise impacts for which no apparent solution is available.

(f) The views of the impacted residents will be a major consideration in reaching a decision on the reasonableness of abatement measures to be provided.

(g) The plans and specifications will not be approved by FHWA unless those noise abatement measures which are reasonable and feasible are incorporated into the plans and specifications to reduce or eliminate the noise impact on existing activities, developed lands, or undeveloped lands for which development is planned, designed, and programmed.

Sec. 772.13 Federal Participation.

(a) Federal funds may be used for noise abatement measures where:

(1) A traffic noise impact has been identified,

(2) The noise abatement measures will reduce the traffic noise impact, and

(3) The overall noise abatement benefits are determined to outweigh the overall adverse social, economic, and environmental effects and the costs of the noise abatement measures.

(b) For Type II projects, noise abatement measures will only be approved for projects that were approved before November 28, 1995, or are proposed along lands where land development or substantial construction predated the existence of any highway. The granting of a building permit, filing of a plat plan, or a similar action must have occurred prior to right-of-way acquisition or construction approval for the original highway. Noise abatement measures will not be approved at locations where such measures were previously determined not to be reasonable and feasible for a Type I project.

(c) The noise abatement measures listed below may be incorporated in Type I and Type II projects to reduce traffic noise impacts. The costs of such measures may be included in Federal-aid participating project costs with the Federal share being the same as that for the system on which the project is located, except that Interstate construction funds may only participate in Type I projects.

(1) Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive land designations).

(2) Alteration of horizontal and vertical alignments.

(3) Acquisition of property rights (either in fee or lesser interest) for construction of noise barriers.

(4) Construction of noise barriers (including landscaping for aesthetic purposes)

whether within or outside the highway right-of-way. Interstate construction funds may not participate in landscaping.

(5) Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. This measure may be included in Type I projects only.

(6) Noise insulation of public use or nonprofit institutional structures.

(d) There may be situations where (1) severe traffic noise impacts exist or are expected, and (2) the abatement measures listed above are physically infeasible or economically unreasonable. In these instances, noise abatement measures other than those listed in Sec. 772.13(c) of this chapter may be proposed for Types I and II projects by the highway agency and approved by the Regional Federal Highway Administrator on a case-by-case basis when the conditions of Sec. 772.13(a) of this chapter have been met.

Sec. 772.15 Information for Local Officials.

In an effort to prevent future traffic noise impacts on currently undeveloped lands, highway agencies shall inform local officials within whose jurisdiction the highway project is located of the following:

(a) The best estimation of future noise levels (for various distances from the highway improvement) for both developed and undeveloped lands or properties in the immediate vicinity of the project,

(b) Information that may be useful to local communities to protect future land development from becoming incompatible with anticipated highway noise levels, and

(c) Eligibility for Federal-aid participation for Type II projects as described in Sec. 772.13(b) of this chapter.

Sec. 772.17 Traffic Noise Prediction.

(a) Any traffic noise prediction method is approved for use in any noise analysis required by this regulation if it generally meets the following two conditions:

(1) The methodology is consistent with the methodology in the FHWA Highway Traffic Noise Prediction Model (Report No.FHWA-RD-77-108)*

* These documents are available for inspection and copying as prescribed in 49 CFR Part 7, Appendix D.

(2) The prediction method uses noise emission levels obtained from one of the following:

(i) National Reference Energy Mean Emission Levels as a Function of Speed (Appendix A).

(ii) Determination of reference energy mean emission levels in Sound Procedures for Measuring Highway Noise: Final Report, DP-45-1R. *

(b) In predicting noise levels and assessing noise impacts, traffic characteristics which will yield the worst hourly traffic noise impact on a regular basis for the design year shall be used.

Sec. 772.19 Construction Noise.

The following general steps are to be performed for all Types I and II projects:

(a) Identify land uses or activities which may be affected by noise from construction of the project. The identification is to be performed during the project development studies.

(b) Determine the measures which are needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This determination shall include a weighing of the benefits achieved and the overall adverse social, economic and environmental effects and the costs of the abatement measures.

(c) Incorporate the needed abatement measures in the plans and specifications.

TABLE 1

Noise Abatement Criteria (NAC)
Hourly A-Weighted Sound Level in Decibels (dBA)*

Activity Category	$L_{eq}(h)$	$L_{10}(h)$	Description of Activity Category
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	70 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	75 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	–	–	Undeveloped lands.
E	52 (Interior)	55 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

* Either $L_{eq}(h)$ or $L_{10}(h)$ (but not both) may be used on a project.

MARYLAND STATE HIGHWAY ADMINISTRATION
Office of Environmental Design
Noise Abatement Design and Analysis Team

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NEPA AND NOISE - An Historical Perspective

May, 1998

The passage of the National Environmental Policy Act (NEPA) in 1969 was clearly the single most important piece of legislation enacted to mandate establishment of regulations and standards related to environmental impact assessment and protection involving Federal agencies. The law was signed by President Richard Nixon on January 1, 1970, concluding more than a decade of discussion, debate and refinement of the principles, policies, and institutional arrangements embodied in the law.

With the enactment of NEPA, and the subsequent passage of the Federal-Aid Highway Act of 1970, the mandate was formalized for the Federal Highway Administration (FHWA) to establish environmental impact assessment standards, procedures and criteria (including noise). Of the two legislative actions, the Federal-Aid Highway Act of 1970 was the driving force behind the mandated development of the regulations standards, procedures and criteria. The first noise regulation was promulgated in 1972 as Policy and Procedure Memorandum (PPM) 90-2. An important side-note; provisions for Type II noise abatement (i.e. retrofitting of noise abatement on existing highways) were not included in the original highway noise regulation PPM 90-2.

A subsequent highway Act passed in 1973 added provisions for Type II noise abatement; also a task force was established by FHWA in concert with State DOT staff with the charge of developing a draft regulation to replace PPM 90-2. The resulting regulation was formally promulgated by FHWA on May 14, 1976 in the Federal-Aid Highway Program Manual (FHPM) Volume 7, Chapter 7, Section 3 and was entitled "Procedures for Abatement of Highway Traffic Noise and Construction Noise" (also referred to as FHPM 7-7-3). This was the first regulation containing Type II provisions.

Since the original FHPM 7-7-3 issuance in May of 1976, multiple minor revisions have occurred, but the basic tenants of the regulation have remained unchanged until recently. Specific revisions and a general chronology are given as follows:

- In 1982, as part of the Reagan Administration "paper-work and red-tape reduction" efforts, FHPM 7-7-3 was revised mostly through elimination of some definitions and removal of a list of factors to consider in developing a prioritization system for Type II projects. In addition, the formal approval of technical noise reports by FHWA was eliminated (summarization of technical noise analysis results are included in the environmental impact statement (EIS) or other environmental documents). Defacto approval of the noise analysis occurs with approval of the final environmental document. Overall, the size of the regulation changed (i.e. the number of pages), but the substance of the language remained consistent with the original (May, 1976) version.

- In 1984, two clarifying words were added resulting in no changes to the overall intent or substance of the regulation.

- In 1991, the document known as the Federal-Aid Highway Program Manual was abandoned through an administrative action to reduce red-tape and duplication. This action just happened to coincide with the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) but was not a result of any legislative mandate. The formal reference was changed to Title 23, Code of Federal Regulations (23 CFR Part 7.7.2.), which contained verbatim, the language embodied in the old FHPM 7-7-3 document. No changes in the regulation itself occurred at this time.

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Finally, as part of a National Highway System (NHS) bill passed in 1995, the first substantive changes to 23 CFR Part 7.7.2. were spawned over the course of the ensuing year and half or so. The "final rule" was placed in the Federal Register on August 11, 1997. The major change from the original regulation centered on Federal participation in Type II abatement projects. Specifically the following changes occurred:

- The original "cut-off" date for Type II eligibility was development which occurred up to May 14, 1976, or thereafter only if local authorities have enacted controls on future land use development. The revised regulation provides a "grandfathering" of any projects approved prior to November 28, 1995, but allows use of Federal funds for Type II projects only for development which predates the highway. (MdSHA has always had this requirement as part of the Type II eligibility criteria.)

- A prescription of possible approval milestones regarding land and highway development are included. No such information was in the original regulation.

- Noise abatement measures (considered under Type II), will not be approved for areas where such measures were previously determined not to be reasonable and feasible for a Type I project. This presents an entirely new provision (not in the original regulation).

The currently applicable version of 23 CFR Part 7.7.2. is attached.

ATTACHMENT - 23 CFR PART 7.7.2.

23 CFR PART 772 - PROCEDURES FOR ABATEMENT OF HIGHWAY TRAFFIC NOISE AND CONSTRUCTION NOISE

AUTHORITY: 23 U.S.C. 109(h), 109(i); 42 U.S.C. 4331, 4332; sec. 339(b), Pub. L. 104-59, 109 Stat. 568, 605; 49 CFR 1.48(b).
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(g) Traffic noise impacts. Impacts which occur when the predicted traffic noise levels approach

or exceed the noise abatement criteria (Table 1), or when the predicted traffic noise levels substantially exceed the existing noise levels.

(h) Type I projects. A proposed Federal or Federal-aid highway project for the construction of a highway on new location or the physical alteration of an existing highway which significantly changes either the horizonal or vertical alignment or increases the number of through-traffic lanes.

(i) Type II projects. A proposed Federal or Federal-aid highway project for noise abatement on an existing highway.

Sec. 772.7 Applicability.

(a) Type I projects. This regulation applies to all Type I projects unless it is specifically indicated that a section applies only to Type II projects.

(b) Type II projects. The development and implementation of Type II projects are not mandatory requirements of 23 U.S.C. 109(i) and are, therefore, not required by this regulation. When Type II projects are proposed for Federal-aid highway participation at the option of the highway agency, the provisions of Subsec. 772.9(c), 772.13, and 772.19 of this regulation shall apply.

Sec. 772.9 Analysis of Traffic Noise Impacts and Abatement Measures.

(a) The highway agency shall determine and analyze expected traffic noise impacts and alternative noise abatement measures to mitigate these impacts, giving weight to the benefits and cost of abatement, and to the overall social, economic and environmental effects.

(b) The traffic noise analysis shall include the following for each alternative under detailed study:

(1) Identification of existing activities, developed lands, and undeveloped lands for which development is planned, designed and programmed, which may be affected by noise from the highway;

(2) Prediction of traffic noise levels;

(3) Determination of existing noise levels;

(4) Determination of traffic noise impacts; and

(5) Examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts.

(c) Highway agencies proposing to use Federal-aid highway funds for Type II projects shall perform a noise analysis of sufficient scope to provide information needed to make the determination required by Sec. 772.13(a) of this chapter.

Sec. 772.11 Noise Abatement.

(a) In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit.

(b) In those situations where there are no exterior activities to be affected by the traffic noise, or where the exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities, the interior criterion shall be used as the basis of determining noise impacts.

(c) If a noise impact is identified, the abatement measures listed in Sec. 772.13(c) of this chapter must be considered.

(d) When noise abatement measures are being considered, every reasonable effort shall be made to obtain substantial noise reductions.

(e) Before adoption of a final environmental impact statement or finding of no significant impact, the highway agency shall identify:

(1) Noise abatement measures which are reasonable and feasible and which are likely to be incorporated in the project, and

(2) Noise impacts for which no apparent solution is available.

(f) The views of the impacted residents will be a major consideration in reaching a decision on the reasonableness of abatement measures to be provided.

(g) The plans and specifications will not be approved by FHWA unless those noise abatement measures which are reasonable and feasible are incorporated into the plans and specifications to reduce or eliminate the noise impact on existing activities, developed lands, or undeveloped lands for which development is planned, designed, and programmed.

Sec. 772.13 Federal Participation.

(a) Federal funds may be used for noise abatement measures where:

(1) A traffic noise impact has been identified,

(2) The noise abatement measures will reduce the traffic noise impact, and

(3) The overall noise abatement benefits are determined to outweigh the overall adverse social, economic, and environmental effects and the costs of the noise abatement measures.

(b) For Type II projects, noise abatement measures will only be approved for projects that were approved before November 28, 1995, or are proposed along lands where land development or substantial construction predated the existence of any highway. The granting of a building permit, filing of a plat plan, or a similar action must have occurred prior to right-of-way acquisition or construction approval for the original highway. Noise abatement measures will not be approved at locations where such measures were previously determined not to be reasonable and feasible for a Type I project.

(c) The noise abatement measures listed below may be incorporated in Type I and Type II projects to reduce traffic noise impacts. The costs of such measures may be included in Federal-aid participating project costs with the Federal share being the same as that for the system on which the project is located, except that Interstate construction funds may only participate in Type I projects.

(1) Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types; time-use restrictions for certain vehicle types, modified speed limits, and exclusive land designations).

(2) Alteration of horizontal and vertical alignments.

(3) Acquisition of property rights (either in fee or lesser interest) for construction of noise barriers.

(4) Construction of noise barriers (including landscaping for aesthetic purposes)

whether within or outside the highway right-of-way. Interstate construction funds may not participate in landscaping.

(5) Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. This measure may be included in Type I projects only.

(6) Noise insulation of public use or nonprofit institutional structures.

(d) There may be situations where (1) severe traffic noise impacts exist or are expected, and (2) the abatement measures listed above are physically infeasible or economically unreasonable. In these instances, noise abatement measures other than those listed in Sec. 772.13(c) of this chapter may be proposed for Types I and II projects by the highway agency and approved by the Regional Federal Highway Administrator on a case-by-case basis when the conditions of Sec. 772.13(a) of this chapter have been met.

Sec. 772.15 Information for Local Officials.

In an effort to prevent future traffic noise impacts on currently undeveloped lands, highway agencies shall inform local officials within whose jurisdiction the highway project is located of the following:

(a) The best estimation of future noise levels (for various distances from the highway improvement) for both developed and undeveloped lands or properties in the immediate vicinity of the project,

(b) Information that may be useful to local communities to protect future land development from becoming incompatible with anticipated highway noise levels, and

(c) Eligibility for Federal-aid participation for Type II projects as described in Sec. 772.13(b) of this chapter.

Sec. 772.17 Traffic Noise Prediction.

(a) Any traffic noise prediction method is approved for use in any noise analysis required by this regulation if it generally meets the following two conditions:

(1) The methodology is consistent with the methodology in the FHWA Highway Traffic Noise Prediction Model (Report No.FHWA-RD-77-108)*

* These documents are available for inspection and copying as prescribed in 49 CFR Part 7, Appendix D.

(2) The prediction method uses noise emission levels obtained from one of the following:

(i) National Reference Energy Mean Emission Levels as a Function of Speed (Appendix A).

(ii) Determination of reference energy mean emission levels in Sound Procedures for Measuring Highway Noise: Final Report, DP-45-1R. *

(b) In predicting noise levels and assessing noise impacts, traffic characteristics which will yield the worst hourly traffic noise impact on a regular basis for the design year shall be used.

Sec. 772.19 Construction Noise.

The following general steps are to be performed for all Types I and II projects:

(a) Identify land uses or activities which may be affected by noise from construction of the project. The identification is to be performed during the project development studies.

(b) Determine the measures which are needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This determination shall include a weighing of the benefits achieved and the overall adverse social, economic and environmental effects and the costs of the abatement measures.

(c) Incorporate the needed abatement measures in the plans and specifications.

TABLE 1

Noise Abatement Criteria (NAC)
Hourly A-Weighted Sound Level in Decibels (dBA)*

Activity Category	$L_{eq}(h)$	$L_{10}(h)$	Description of Activity Category
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	70 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	75 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	–	–	Undeveloped lands.
E	52 (Interior)	55 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

* Either $L_{eq}(h)$ or $L_{10}(h)$ (but not both) may be used on a project.